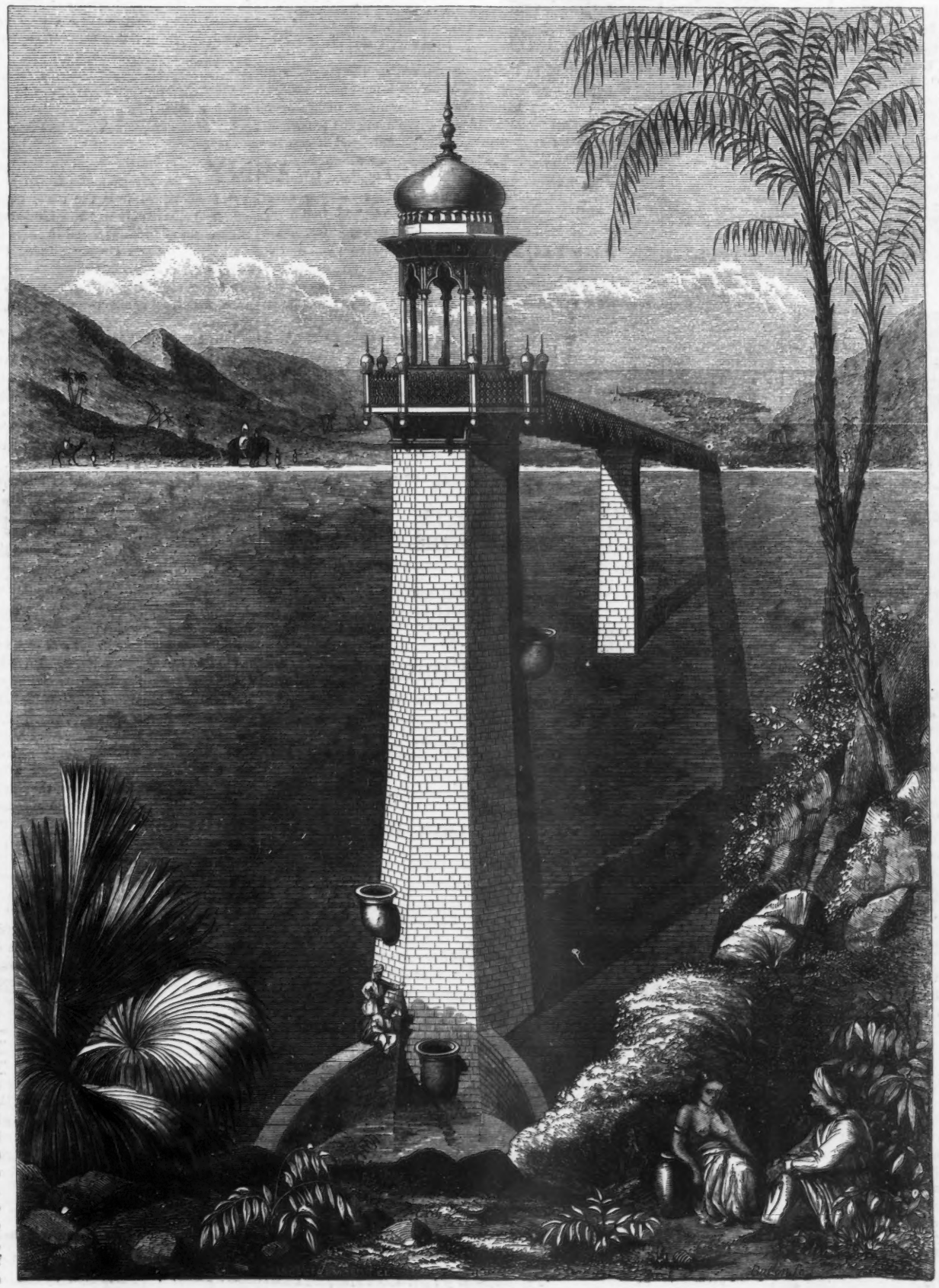
THE ENGINEERING AND MINING JOURNAL.

VOL. VIII.—No. 6.—THIRD SERIES.] NEW-YORK, TUESDAY, AUGUST 10, 1869. [SINGLE COPIES, 10 CENTS.

The Bombay Water-Works.

THE city of Bombay has a population exceeding six hundred thousand! It is becoming daily more and more important, not only on account of its western position—being the first Indian port reached on the Sucz route—but also in view of its general accessibility by sea, rail, and river. The city of Bombay, like that of New-York, is, situated upon an island. Although it is, for India, a comparatively healthy city, nevertheless the fear of epidemic diseases impelled the municipal authorities to give their serious attention to the all-important question of drainage and water-supply. Works were constructed and a water-supply obtained, which, however, now proves to be deficient, both as regards amount and quality. In view of such a state of affairs, the government authorities were induced to take immediate steps in the way of improvements upon a more extended scale. A consideration of the subject in our columns will not be unworthy of the reader's attention. The population of Bombay, which in 1815 numbered but 220,000, had in 1851 increased to 520,000; and, owing to the nature of the climate, this enormous population was for eight months of the year entirely dependent on water supplied from wells or tanks situated in various parts of the island. These wells and tanks were annually replenished during the four months of the South-west monsoon, when there is an average rainfall of about 75 inches. During the time of the rains and the two or three succeeding months, there was an ample supply for the use of the inhabitants, but as the level of the water in the tanks and wells lowered, there can be no doubt but that the water in them was, in part at least, replaced by sewage which filtered in from the drains, which were but little better than stagnant receptacles for filth. Hence it happened that when the hot season set in, the wells were nearly all dried up or unfit for use, the water in the public tanks was positively filthy, and there is every reason to believe that the prevalence of cholera toward the end of every dry season was due to the extreme pollution of the only water which could then be obtained. But no active steps in the way of improvement were taken until the year 1856, when the source of supply known as the Vehar Lake was fixed upon. The outlets of this lake, which had an area of 1260 acres, were so dammed up as to form a large impounding reservoir. The annexed illustration represents one of the slopes of this reservoir, showing the water-tower arranged with valves with curved mouths, set at various altitudes, so that the water can be drawn off at any required level. We would call particular attention to the design of the aforementioned tower. In a recent article in the ENGINEERING AND MINING JOURNAL we demonstrated the importance of the artistic appropriateness of a design, with regard to its purpose and locality. The design of these works appears to fulfil the above desiderata. The moresque character of the design of this water-tower, surmounted by a graceful cupola and parapet, harmonizes most favorably with the Eastern character of the surrounding. Then, again, the structure tells its own tale; it conveys at once an idea of its object. The present works are capable of supplying ten gallons per head, per diem, to a population of seven hundred thousand.



THE BOMBAY WATER-WORKS.

But, as before stated, this amount not proving sufficient, either in quantity or quality, for the wants of the community, a commission was appointed to report on the subject of the extension and improvement of the water-supply. The engineer of the city has suggested the desirability of including the adjacent lake of Shewla in the supply. He further proposes to conduct the water through a 4-foot 6-inch *steel* main. The average rainfall at Vehar is from 100 to 110 inches. As there is much matter of interest in the report above referred to, we will give some extracts from it: "The country is covered with vegetation, and large quantities of different species of water-plants have grown on the lake; there is dead and decaying organic matter, as all lakes with shelving margins are liable to have the space between high and low water fouled by various sources of impurity. This has hap-

pened in the case of the Vehar lake in a tropical climate. The result has been that the water, especially that drawn from the deeper part of the lake, has become impure, and the practical question is, how this state of things is to be remedied, and its recurrence prevented. There is nothing in the case different from what might have happened in England under similar circumstances; only in India all the sources of impurity are rendered of more importance by the nature of the climate. In dealing with the subject, we shall, in the first instance, re-state the principles of water-supply bearing on this and similar cases already laid down in our suggestions for the sanitary improvement of Indian stations. In these suggestions we have pointed out that the most common source of organic impurity in mountain districts is superabundance of decaying vegetable matter from trees and jungle, and that waters of this class are unfit for use unless they are purified by filtration. We have further stated that the most common source of animal organic matter in Indian tanks is surface filth. We have shown the necessity for removing all extraneous impurities from the sources of water supply, and that the channels, stream-courses in valley lines, and conduits, connected with impounded tanks and reservoirs should be cleansed and paved, so as to present a clean surface, and that care should be taken to prevent all gathering surfaces becoming fouled. We have further stated that storage reservoirs must be fenced in, and that conduits, open or covered, must be regularly looked to, and scavenged so as to prevent fouling. Precautions of this nature are necessary in Great Britain, in order to effect this, that, at the fountain-head, every probable source of impurity may be constantly removed, and there are usually clauses inserted in the Water Companies' Acts for punishing all persons wilfully injuring the purity of the sources of supply. These precautions are an indispensable part of the Sanitary Police of Waterworks, the main functions of which are to keep a constant and unremitting watch over all gathering surfaces, reservoir, banks, brooks, and channels, through which any part of the water flows. The very same principles are applicable to the Bombay case, and to all similar cases. Every means must be adopted to remove decaying vegetation from conduits and channels, conveying water to or from impounding reservoirs. The amount of living vegetation to be left on gathering surfaces will depend on local circumstances, but there can be no doubt that dead vegetation, such as dead leaves, branches, decaying timber, and the like, near the lake, should be removed, and the gathering surfaces kept as clear as possible of all such sources of impurity. In planning new works, the nature of the gathering surface, and the amount and character of its vegetation, require consideration as one of the elements in selecting a source of supply. Another source of impurity in impounding reservoirs, with sloping banks, is the growth and decay of vegetation, or the deposit of foul matters on the exposed bank between high and low water mark. An immediate remedy for this, is cleansing and removal of vegetation and impurities from the exposed surface. Wherever the extent of exposed surface between high and low water can be lessened by banking out shallow areas, this should be done. A further diminution of risk of impurity from the exposed bank can be obtained by paving it with stones, as is done in the large filtering establishments in this country. Paved surfaces of this class can readily be cleansed, and one great cause of impurity of water in reservoirs cut off. But after every precaution is taken to insure that the source of supply is kept as free as possible from extraneous impurity, there will always be more organic matter in impounded water than is desirable for health. Hence, in our suggestions already referred to, we have in every case advised that waters of this class, whether contained in large reservoirs, or in ordinary tanks, should be filtered before use, for the double purpose of removing suspended impurities, and of oxidizing dissolved organic matter. This precaution is absolutely necessary. No water-supply can be considered safe without sand-filtration. We have given in our suggestions, plans and sections of filtering arrangements suitable for water-supplies of both large and small amounts. Most of the water supplied to large cities and towns in Great Britain undergoes sand-filtration before passing into the mains, as is to be done with the water-supply of Calcutta. The whole of the water-supply of London is sand-filtered.

The East London Company filters 20 millions of gallons per day, through 12 statute acres of sand-filter. The new River Company uses 11½ acres of sand-filter for filtering 18 millions of gallons a day. The Lambeth and Vauxhall Water Company, the Chelsea Company, and the West Middlesex Company, taking about 48 millions of gallons of water per day from the river Thames, sand-filters the whole. When the water is turbid on account of floods, it is first run into depositing reservoirs to be purified by subsidence before it is passed into the sand-filter. The rate of filtering is about 700 gallons every 24 hours, for every square yard of sand surface. The filters are run dry, the surface scraped about once every five weeks—less in cold weather, more in hot weather; less when the water to be filtered is clear, more when it is turbid. In some filters the depth of sand at the surface is 2 feet 6 inches; in others 4 feet. The filtration and oxygenation of the water is chiefly accomplished by the upper 6 inches of sand. The thicker the layer of sand, the slower the process, and the more perfect is the deposit of sediment by gravity. Under certain circumstances, a layer of wood or animal-charcoal may be placed in the filter. The London companies use clean sand only. After filtration, the water is received into covered service reservoirs, whence it passes directly into the mains, and so to the houses. Water once filtered is never again allowed to become foul on the works of the London Water Companies, as it is passed directly into covered reservoirs, and thence into the supply-mains, without any further exposure to extraneous sources of impurity.

These principles, which have been arrived at by experience in this country, indicate what ought to be done in the case of the Vehar Water-works, and in all similar cases in India.

It is therefore recommended (1), that means, such as those stated above, be taken to preserve the water in the Vehar lake as free as possible from decaying organic matter proceeding from the gathering ground, and from the margins of the lake or from conduits.

(2). That all water supplied to Bombay from the lake be drawn from the lake through fine wire-screens, so as to prevent floating matter and fish entering any conduit, and that such water in all cases be sand-filtered, and passed into a covered pure-water tank or reservoir in immediate connection with the filters, previous to distribution through the mains.

(3). That the filters and covered pure-water reservoir should be at the Bombay end of the pipe conduit if practicable. The contents of the covered reservoir should be equal to a day's supply of the population.

(4). That similar measures be adopted for preserving the purity of sources of supply of all open water-tanks in which water is stored for domestic use, and that all open tank-water be sand-filtered and stored in covered expense tanks or cisterns, from which it can be drawn pure for consumption.

If these precautions be diligently carried out, the other questions raised in the papers, regarding the propriety or not of permitting the growth of water-plants and fish in impounded reservoirs and tanks will become of little importance. Living vegetation, if not allowed to exist to such an extent as to interfere with the supply-works, and if care be taken to remove all dead vegetation from the surface and banks, and if possible from the bottom of the lake, is rather an advantage than otherwise, unless the plants be poisonous. The vegetation exists for a specific purpose, and that is the conversion of dead organized matter into living forms. This is one of nature's processes for purifying water. The flow of impure water over clear rocky channels is another. Both agencies are useful in their place and degree. In the same way, the existence of fish in impounded reservoirs or tanks is not necessarily injurious. On the contrary, their tendency is to preserve that balance in vital forces throughout the body of water which tends to reduction of dead organized matter. Certain kinds of water-plants and fishes are perhaps better adapted for these ends than others, and this question may very well be studied in India. As regards the depth from the surface at which water should be drawn from the Vehar lake, it should be taken as near the surface as possible; but this is a matter of secondary importance if the water is filtered; there would be no difficulty, however, in arranging the outlets, so that water might be drawn from any depth, or always close to the surface, if considered desirable.

A New System of Assay Weights for Gold and Silver Ores.

BY PROF. C. F. CHANDLER.

THE French decimal system of weights is now employed in most laboratories in this country. In analyses and assays a certain number of grammes of ore are weighed out; the desired constituents are then separated and weighed in grammes and decimals of a gramme. By multiplying the weights of the constituents by one hundred, and dividing by the weight of material employed, the results are obtained in percentages.

For example, 2 grammes of a copper ore are found to contain 0.4428 grammes of copper.

$$0.4428 \times \frac{100}{2.} = 22.14 \text{ per cent of copper.}$$

Whenever the results of an analysis can be reported intelligibly in per cent, the French weights are by far the most convenient, and in fact leave nothing to be desired. In the assay of gold and silver ores, however, considerable inconvenience still exists, owing to the fact that the quantity of precious metal bears so small a ratio to the weight of the ore that percentages fail to convey to the mind a clear idea of its value; consequently the results of the assay are recorded in troy ounces, or in dollars per ton of 2000 lbs.

As, however, the French weights are employed for weighing the ore examined and the precious metal obtained, and as there is no simple ratio between the troy ounce and the ton of 2000 lbs., the labor of calculating the results from grammes to troy ounces is very considerable, and the assayer is constantly liable to make mistakes in multiplying and dividing the long lines of decimals involved. The following example will illustrate this difficulty:

50 grammes of quartz were assayed, yielding gold 0.00475 grammes; silver, 0.00092 grammes.

Reducing these numbers to percentages, we have

$$0.00475 \times \frac{100}{50} = 0.0950 \text{ per cent of gold.}$$

$$0.00092 \times \frac{100}{50} = 0.0185 \text{ per cent of silver.}$$

Reducing them to troy ounces per ton of 2000 lbs., we have

$$1 \text{ ton} = \frac{2000 \text{ lbs.} \times 7000 \text{ grains}}{480 \text{ grains in troy ounce}} = 29{,}166\tfrac{2}{3} \text{ troy ounces.}$$

$$29166\tfrac{2}{3} \times \frac{0.00475}{50.0000} = 2.77 \text{ ounces gold.}$$

$$29166\tfrac{2}{3} \times \frac{0.00092}{50.0000} = 0.54 \text{ ounces silver.}$$

To avoid the labor and danger of mistakes involved in the above calculation of results in troy ounces, the following table was constructed, by means of which the labor was reduced to a single multiplication.

Table showing the value of 0.001 gramme—1 milligramme—of precious metal when obtained from different quantities of ore:

0.001 gramme, or 1 milligramme.

From 100	grammes	equals	0.2916	troy	ounces	per	ton.
" 50	"	"	0.5833	"	"	"	"
" 25	"	"	1.1666	"	"	"	"
" 20	"	"	1.4582	"	"	"	"
" 10	"	"	2.9165	"	"	"	"
" 5	"	"	5.8330	"	"	"	"
" 2	"	"	14.5825	"	"	"	"

To employ this table in the above assay of quartz, we have merely

$$0.5833 \times 4.75 = 2.77 \text{ ounces gold.}$$
$$0.5833 \times 0.92 = 0.54 \text{ ounces silver.}$$

In other words, we multiply the value in ounces of 1 milligramme, when obtained from the quantity of ore we employed, by the number of milligrammes of precious metal obtained.

In using this table, it was found that persons who were not extremely accurate in figures were very liable to misplace the decimal point, so that the results would be recorded ten or one hundred times too high or too low. To obviate this difficulty, the following very simple set of weights has been devised, and after its use for a year in the laboratory of the School of Mines, Columbia College, I am able to say that it leaves nothing further to be desired in this direction. As shown above, the ton of 2000 lbs. contains 29166 troy ounces. If we use 29.166 grammes of ore in our assay, every milligramme (0.001) of precious metal obtained will be equal to $\frac{1}{29166}$ of the ore, which will be 1 troy ounce in 1 ton of 2000 pounds.

This is the starting-point in the new set of weights. A weight of 29.166⅔ grammes is our assay ton, and a milligramme obtained from the *assay ton* of ore is an *assay troy ounce*. We have only to write milligrammes as units to have our weight of precious metal in troy ounces per ton.

The gold quartz already alluded to yielded from 1 assay ton 0.00277 gold, 0.00054 silver.

Moving the decimal point to make the milligrammes read units, we have 2.77 ounces gold per ton, and 0.54 ounces silver per ton.

We find in practice, however, that it is not always convenient to use 1 assay ton of ore; for very poor gold ores, it is frequently desirable to use two, three, or four times as much, and for silver ores very much smaller quantities. We employ, therefore, a series of weights varying from one twentieth of an assay ton to 4 assay tons—the value of the milligramme of precious metal varying at the same time from 20 ounces to one fourth of an ounce per ton of ore. These weights were manufactured for the School of Mines, by H. Becker & Sons, the celebrated makers of fine analytical and assay balances:

The set includes the following weights:

				VAL. OF MIL.
4 assay tons, or	116.6666	grains,	...	0.25 ounces.
2 " "	58.3333	"	...	0.50 "
1 " "	29.1666	"	...	1. "
1-3 " "	9.7222	"	...	3. "
1-6 " "	4.8611	"	...	6. "
1-10 " "	2.9166	"	...	10. "
1-20 " "	1.4583	"	...	20. "

also the gramme series from 100 grammes to 0.010 grammes (10 milligrammes) for fluxes and ores of baser metals.

This set of weights is intended for weighing ores and fluxes, and Becker & Sons now manufacture a beautiful little balance (called by them "ore scales") to be used with these sets, far superior in accuracy, strength, and durability to any thing else of the kind.

These weights and balance, though designed for ores and fluxes, are sufficiently accurate for weighing the buttons of metal obtained in many assays, though it is better, particularly with small gold globules, to use the assay balance and fine weights. They also answer for many technical analyses.

In case it is desirable to report results on the gross ton of 2240 lbs., the ounces per ton of 2000 lbs. are to be multiplied by 1.12, or a set of weights could be employed in which the assay ton should weigh 32.666⅔ grammes, as there are 32666⅔ troy ounces in 2240 lbs.

For the convenience of those obliged to use the gross ton, I append the following table, which shows the value of .001 grammes (1 milligramme) precious metal in ounces per gross ton of 2240 lbs. when obtained from different quantities of ore:

0.001 from	100	grammes	equals	0.3266	ounces	per ton.
"	50	"	"	0.6533	"	" "
"	25	"	"	1.3066	"	" "
"	20	"	"	1.6333	"	" "
"	10	"	"	3.2666	"	" "
"	5	"	"	6.5333	"	" "
"	2	"	"	16.3333	"	" "

To fix the money value of the ores, the values of gold and silver must be employed. These are for gold $20.67 coin per troy ounce, for silver $1.27 coin per troy ounce.

This system of assay weights has now been in use in the laboratory of the School of Mines for three years, and it seems to leave nothing further to be desired in this direction.

Steamboats on the Erie Canal.

MR. DRAPER STONE, of Rochester, has invented a method of navigating the Erie Canal by steam. "The engines will occupy but a small space in the canal-boat—say 12 feet by 16 feet—not to exceed eight-horse power; the propeller will make but a small wash; the power always sufficient to take in tow one boat; the fuel cheap." This is the real foundation of the whole plan, and easily obtainable. The boiler and machinery would be constructed for the fuel, and would cost about $1600.

Colorado from an Engineering Point of View.

TO THE EDITOR—SIR:—To the traveller, after the hot and dusty ride from Denver, Central City and its surroundings present any thing but an inviting appearance. The hill-sides, denuded of timber, are scarred with numberless pits and ditches showing the former labors of prospecters. Rows of low wooden houses, with now and then a brick building, line the street, and no inviting hotel welcomes to a wash and repose. Here and there, a long line of shaft-houses shows the direction of some prominent lode; stamp-mills, some in operation, and others only partly completed and with useless machinery lying around, are frequent; and a small stream of very dirty water flows through the ravine in which Central City is situated. Altogether the first glance at the city, crowded as it is into the narrow gulch, is apt to give no very agreeable impression, and only after experiencing the great kindness and hospitality of the inhabitants, does the "pilgrim" feel any desire to remain in the place.

And here we are in the centre of a tract of country containing a complete net-work of veins, which, if worked properly, would produce immensely. Here we are in the El Dorado which caused in the East such an excitement in 1864, and into which such sums of money were thrown, to be expended, however, in any thing but working the mines. Colorado is a name exceedingly distasteful to many Eastern capitalists, but Colorado itself appears to have little reason to be thankful for any benefits conferred by Eastern capital. In fact, leaving the slur on its reputation out of the question, there is every ground for supposing that the Territory to-day would be in a much better condition had it been left severely to itself; for the money expended here by stock companies in most cases has been worse than thrown away—the mines having been left untouched, and before a ton of ore was extracted the capital consumed in building costly mills with expensive and useless machinery, in transporting patent apparatus costing from fifty cents to a dollar per pound, and never worth more than its value as old iron, and in increasing the tribe of cheats.

Before pronouncing the verdict that all miners are swindlers and all mining operations worthless, let those who have suffered in pocket reflect how much in fault they have been themselves, and how insanely they have acted. What dry-goods merchant, for instance, in New-York would purchase at a high price a large lot of land situated, we will say, in some indefinite position near San Francisco, on mere information from some unknown and interested party that brewing was immensely profitable, and that the land in question would produce huge crops of barley?—would immediately erect a large brewery, and insist on filling it himself with patent vats and mills, without consulting some reliable expert on the subject?—would then send some fast nephew or broken-down business-man to find the land, raise the grain, and run the works, never inquiring whether the soil or climate was adapted to the crop, whether there was any good water in the vicinity, whether the agent was skilled and honest, what the price of labor was, etc., etc.? And should any one do thus, how would he be considered by business-men, what sympathy would he receive in the certain case of non-success, and how much justice would he have in calling all San Franciscans liars and swindlers, and all breweries failures? Yet on this very plan have business-men of the East gone into mining, buying unknown property at enormous rates, investing in machinery the merits of which have never been tested, building stamp-mills entirely disproportioned to the mines, and then sending some loquacious party to hunt up the often visionary mine, to work the property so as to clear immediately 50 to 100 per cent on the capital, and all at such a distance that no restriction could be had on the agent; and where the property has been valuable, what superintendent, however honest or well fitted, can work successfully with no ready money, but only worthless machinery and a large debt to commence with?

But the question naturally arises, Can the mines here ever be run at a profit? Certainly, *if properly worked*. With a good agent, some cash in hand, and a sufficiently large area of ground, mining will surely succeed. Every company ought to have a reserve fund for bad times, and not pay out in dividends all money as fast as received, leaving nothing on hand for carrying on explorations in advance of the workings. Again, as things now stand, the claims are too small; they should be made larger if possible. Take the Gregory lode, for instance—the oldest in this country. This has been traced and partially worked for about 4000 feet. But on this 4000 feet, there are at least thirteen companies. Now, each company must have apparently its own agent, its two shafts, its separate engine, pumps and hoisting apparatus, its stamp-mill, etc. Thirteen agents, thirteen engines, thirteen pumps, and twenty-six shafts are ridiculous for any 4000 feet of property, especially when, as in the present case, one agent, a tunnel, and two shafts (at least for some time yet) would be amply sufficient. The property must be consolidated before it ever pays, but it seems as if the day of consolidation were still far distant, and it is to be feared that it will not come until all companies except one or two have failed so fatally as to allow the survivors to buy up the property at a moderate rate. Such thoughts as the above are apt to occur to the stranger visiting mining regions and seeing such marks of folly as are everywhere visible. I have written them down because injustice has been done to Colorado, and because people as yet seem unaware that mining is as much a business as any thing else, and *must be managed on business principles*.

The following notes, collected during a brief stay of a couple of weeks in the Territory, must necessarily be fragmental, and not always as correct as might be desired, a much longer residence being necessary for a complete and accurate inspection of the country; moreover, all miners are not possessed of the proper scientific knowledge; and hence one cannot always rely upon information received, but must, for the most part, generalize from the few facts observed. For the mineralogist and geologist, a fresh and interesting field lies waiting, and a summer might well be passed in the study of the natural features of the place. And I must not omit to add that the people are exceedingly kind and obliging to the stranger, freely showing the mines, and doing all in their power to aid one in obtaining any desired information. During my stay here, I have not received a cross or impatient answer, nor a single refusal when desiring to inspect a mine or mill.

We will here consider only a limited portion of the country—namely, that containing the gold veins lying within the radius of a mile and a half from Central City—a very small, but withal very important fraction of the "great mineral belt" of Colorado, which belt, running in a northeasterly and southwesterly direction, nearly through the centre of the Territory, and along the foot-hills of the Snowy Range, has been traced for a length of over a hundred miles, and for an average width of about twenty. Travellers from the East leave the Union Pacific Railroad, at Cheyenne, and have a long and tedious stage-ride of twenty-two hours' duration to Denver, which lies in the plains, about ten to fifteen miles from the mountains. Thence, another ride of some ten hours brings us past Golden City, where coal and fire-clay are said to be abundant, up and down ravines in the foot-hills to North Clear Creek, along this stream, a couple of miles to Black Hawk, at the junction of the creek and of Gregory Gulch, and thence up the gulch to Central City. A mile further on to the left, up Nevada Gulch, lies Nevada.

The country just here is merely an alternation of hill-side and gulch, level land being unknown. Timber once covered the ground, but now no trees are to be seen in the immediate vicinity; all wood required for fuel being hauled from a distance of five to six miles, and selling at the present time for from five to seven dollars per cord, according to location. The water-power is entirely inadequate to the requirements of the stamp-mills, which are run mostly by steam—the amount of water being scarcely sufficient for the batteries, and in winter not even for these; causing many mills to lie idle three or four months in the year. The "Consolidated Ditch" brings water from Fall River, a stream to the west of North Clear Creek, but in limited quantity. It is proposed, however, to enlarge this ditch, and to build reservoirs so as to get a supply sufficient for all requirements. A. D. H., JR.

CENTRAL CITY, COL., July 21st, 1869.

Metals Absorb Gases.

IT is seldom that such remarkable results of scientific investigation are brought to the notice of the members of the Royal Institution, London, at their weekly meetings, as lately by Professor Odling, who delivered a lecture "On the Absorption of Gases by Metals," founded on the recent researches of Mr. Graham. On a previous occasion this year, Professor Odling explained the results of Mr. Graham's discoveries on the diffusion of gases, in which he made known the fact that mixed gases may be separated, on passing through a membranous substance into a perfect vacuum; and by that means the oxygen of the atmosphere may be separated from the nitrogen. In pursuing his investigations, it was found that the metals platinum and palladium are permeable, when heated to redness by hydrogen gas, but by no other kind of gas; and, further, that those metals under certain conditions absorb an immense quantity of hydrogen, which they retain as a component part. Experiments were first made with platinum heated in an atmosphere of hydrogen gas, when it was ascertained that the quantity of gas absorbed by the metal depended greatly on its texture. When in an ordinary melted state the volume of gas absorbed amounted to about 18 per cent of that of the metal; when the metal was in a spongy state, its absorbing power was much increased; and when hammered and wrought, it absorbed upward of 400 times its own volume of the gas. In the experiments with palladium, the results were still more remarkable, for the quantity of hydrogen gas absorbed by that metal amounted to upward of 600 times its bulk. This "occlusion" of the gas in the substance of the metal was permanent, and it could only be expelled when heated in a vacuum. Platinum and palladium are the only metals as yet ascertained to have this remarkable property of absorbing hydrogen gas; but several metals absorb other gases, and each one seems to possess a natural quantity. The experiments with iron show some remarkable results, and induce speculations as to the condition of the atmospheres of stellar bodies. Iron in the state produced in our furnaces contains fixed in its composition a large amount of carbonic oxide, resulting from the process of manufacture at a high heat in contact with that gas. Such iron Professor Odling called "telluric iron," to distinguish it from "sidereal iron," or the iron contained in meteoric stones. In the latter there is absorbed many times its bulk of hydrogen gas, from which fact it is inferred that the meteoric iron was surrounded when in an incandescent state by an atmosphere of hydrogen gas. Some recent results of spectrum analysis also show that the atmospheres of some of the stars are composed of hydrogen, thus confirming the opinion of the condition of the formation of meteoric iron, and proving, as Professor Odling observed, that there is only one system of chemistry throughout the universe. He succeeded, by experimenting with a portion of meteoric iron, in extracting from it a small quantity of its occluded hydrogen, which he exploded, as a specimen of the atmosphere of one of the unknown planets of the solar system. The discovery of the property of the absorption of gases by metals may, it was stated, lead to important practical results in the manufacture of steel, for it serves to explain the cause of the penetration of carbon into the centre of a mass of molten iron, and its conversion into steel.

"Heat Unit—New Method of Determining."

TO THE EDITOR—SIR: If it is desired to estimate the mechanical equivalent of heat, founded on the supposed case of the cannon-ball being raised to a "red or white heat" by means of striking an iron target, and to eliminate from the result the errors that have been pointed out in a previous communication, we proceed thus:

The mechanical equivalent in foot-pounds of a body weighing one hundred pounds, set in motion with an initial velocity of 5280 feet per second, is equal to the mechanical equivalent of a body falling without impediment, and attaining this velocity at the end of its fall; or, to make this well-established mechanical law more clear to those to whom it may be somewhat new, suppose a ball is fired upward with this velocity. it will attain a certain height, and when descending reach the ground with its initial velocity, allowance being made, of course, for atmospheric resistance. This height is to be multiplied with the weight of the body, which result will truly represent the number of foot-pounds equivalent to the initial force driving the ball. Calling this height, D, the initial velocity or acquired velocity, during the descent, V, we have, according to a well-known formula in natural philosophy,

$$D = \frac{V^2}{64} = \frac{5280^2}{64} = \frac{27878400}{64} = 435,600 \text{ feet.}$$

This number represents the height to which a ball, fired upward with the above-mentioned initial velocity, would attain in a vacuum. In descending, under like conditions, it would of course at the last, attain the same velocity. Now, this height, multiplied by the weight of the ball, will represent the exact number of foot-pounds equal to the initial force—to wit: the force of the gunpowder. This gives 100x 435,600=43,560,000 foot-pounds.

To give a clearer insight into this subject than can be obtained from formulæ by those not familiar with them, I introduce here a table representing, in as simple a manner as possible, the laws of the relations in time, space, and velocity of falling bodies. It explains itself, it being only necessary to remark that the distance of 16 feet used in the table should be, strictly taken, 16 feet and 1 inch, what it really is in a vacuum; and also at the surface of the ocean in latitude 45°. However, near the equator, or above the surface of the ocean, it is less, and with the air as an obstruction still less. Sixteen feet is therefore adopted as being near enough to the truth to serve our purpose.

TABLE EXPRESSING THE LAWS THAT GOVERN FALLING BODIES.

Time in seconds.	Velocity at the end of each second.	Space passed thro' during each second.	Totality of space passed through at the end of each second.
1.....	2×16 feet.	1×16 feet.	$1^2\times16$ feet.
2.....	4×16 "	3×16 "	$2^2\times16$ "
3.....	6×16 "	5×16 "	$3^2\times16$ "
4.....	6×16 "	7×16 "	$4^2\times16$ "
5.....	10×16 "	9×16 "	$5^2\times16$ "
6.....	12×16 "	11×16 "	$6^2\times16$ "
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
164.....	328×16 "	327×16 "	$164^2\times16$ "
165.....	330×16 "	329×16 "	$165^2\times16$ "
	$=5280$ "	$=5274$ "	$=453,600$ "
t	$2\,t\times16$ "	$(2\,t-1)\times16$ "	$t^2\times16$ "

It is not only unnecessary to reduce the 43,560,000 foot-pounds thus obtained to horse-power, but it is decidedly wrong. A certain number of foot-pounds, or the product of the weight into the distance is all we have to deal with. The element of time is foreign to our purpose. This number of foot-pounds may be spent in one hour, one minute, or one second—theoretically, it will produce the same number of heat units. A horse-power being equal to 1,980,000 foot-pounds per hour, 33,000 per minute, or 550 per second, 43,560,000 foot-pounds, divided by these three numbers, will give respectively, 22, 1320, and 79,200 horse-power, whether this force of 43,560,000 foot-pounds be spent in one hour, one minute, or one second

This train of reasoning shows us that the power which imparted the initial velocity of 5280 feet per second is greater or smaller in accordance with the time spent in communicating this velocity. According to the formula $T=V\div32$, the force of gravitation requires 165 seconds to effect this, after which time the body will have attained the final velocity of 5280 feet per second. The force of the gunpowder effects it in a very short space of time, a fraction of a second; commencing at the moment of the ignition of the powder, and terminating properly at the instant the ball leaves the muzzle of the gun. Now, suppose this time to amount to the one-hundredth part of a second; then, since a horse-power is equal to 5.5 foot-pounds in the one-hundredth part of a second, the 43,560,000 foot pounds will have to be divided by 5.5 to find the number of horse-power exerted by the powder in the short space of the one-hundredth part of a second. This quotient is 7,920,000.

This, by the way, explains the startling effects of certain explosions, every thing depending on the *shortness of time* required for the action to take place. Chemical calculation shows that the amount of gaseous expansion produced by the explosion of nitro-glycerine, Giant powder, and other fulminates, is no larger than that produced by gunpowder. It is the suddenness of the combustion in the case of these fulminates which bursts the gun, the ball not having time to advance a single inch. Compared with this, the burning of gunpowder is a slow process. It explains, moreover, the

striking effects of a blow or concussion produced when a heavy body, moving with great velocity, meets with an obstruction. If the obstruction gives way gradually, time is consumed and little effect produced; but if the obstruction is unyielding, so as to stop the motion in a very short space of time, the force of a number of foot-pounds is concentrated in that very short space of time; it thus becomes equivalent to a very great amount of power.

In the case under discussion, the one-hundred-pound ball, moving with a velocity of 5280 feet per second, diminished only by the resistance of the atmosphere during a single second, and striking an iron target of 80,000 pounds weight, possessing, therefore, a weight 800 times greater than that of the ball, would communicate a motion to the target of nearly 5280÷800, or 6.6 feet per second. Such would be the case if the motion of the ball was slow enough to enable the motion to be communicated to the mass of the target. As the case stands, however, the motion is so rapid that the ball indents the part of the target where it strikes, perhaps penetrates its layers to a certain depth, thereby disturbing the molecular cohesion of the particles, and performing an amount of work which it is impossible to determine, though it all reäppears in the form of heat, observed as the result of the compact. We must here make a rough estimate, and say it amounts to a work of 1,932,704 foot-pounds. We can then sum up as follows: 1. Loss on account of resistance of the air is 10,000,000 foot-pounds; 2. Work done in smashing the target, 1,932,704 foot-pounds—giving a total of 11,932,704 foot-pounds, which, subtracted from 43,560,000 foot-pounds, gives a residue of 31,627,296 foot-pounds to be converted into heat. Now comes the question as to what is the correct temperature of a red-hot cannon-ball. Is it dull red at 1200°, full red at 1300°, bright red at 1400° or 1500°, or at a white heat at 1600° or 1700° Fahr.? On page 35, 1832° has been adopted, which corresponds, according to the latest and most correct investigations, to the melting point of cast iron. But I will take this number, and grant that the number of units of heat of such a ball is 20,484; though this number is, under the conditions assumed, not exactly correct. Now, since the iron target necessarily takes on one half the increase of temperature, it will, after the concussion, have gained 20,484 units; the total being 40,968 units, which number, divided into 31,627,296 foot-pounds to be converted, gives exactly 772 foot-pounds for one unit of heat.

This calculation is, to say the least, free from the errors of the one given on page 35, but, nevertheless, utterly worthless as regards accepting it as a base for determining the correctness of the generally adopted mechanical equivalent of heat. I do not, therefore, give it as a demonstration, but for these two reasons: firstly, from the fact that it may furnish occasion for many instructive and practically useful remarks; and, secondly, in order to show how easy it is in so-called demonstrations of this kind to arrange numbers beforehand, so as to obtain any result we may wish to arrive at. This would seem to be the course pursued by your correspondent in his article on the "Heat Unit," page 35, in obtaining as his result 1168 foot-pounds. Unfortunately, by overlooking a self-evident fact, he really obtained only half that number; but, withal, by rearrangement of the figures, he might easily have obtained any thing desired.

NEW-YORK CITY, August 4th, 1869. DR. V.

The Gulf Stream.

M. JAMES CROLL, who has published some papers on this subject, speculates thus as to the stream as a heat-carrying medium. The total quantity of water, he says, conveyed by this stream is probably equal to that of a stream 50 miles broad and 1000 feet deep, flowing at the rate of four miles an hour. And the mean temperature of the entire mass of moving waters is not under 65° at the moment of leaving the Gulf. I think we are warranted to conclude that the Gulf Stream, before it returns from its northern journey, is on an average cooled down to at least 40°; consequently it loses 25° of heat. Each cubic foot of water, therefore, in this case carries from the tropics for distribution upward of 1500 units of heats, or 1,158,000 foot pounds. According to the above estimate of the size and velocity of the stream, 5,575,680,000,000 cubic feet of water are conveyed from the Gulf per hour, or 133,816,320,000,000 cubic feet daily. Consequently, the total quantity of heat transferred from the equatorial regions per day by the stream amounts to 154,959,300,000,000,000,000 foot-pounds. From observations made by Sir John Herschel and by M. Pouillet on the direct heat of the sun, it is found that were no heat absorbed by the atmosphere, about 83 foot-pounds per second would fall upon a square foot of surface placed at right angles to the sun's rays. Mr. Meech estimates that the quantity of heat cut off by the atmosphere is equal to about 22 per cent of the total amount received from the sun. M. Pouillet estimates the loss at 24 per cent. Taking the former estimate, 64·74 foot-pounds per second will therefore be the quantity of heat falling on a square foot of the earth's surface when the sun is in the zenith. And were the sun to remain stationary in the zenith for twelve hours, 2,796,768 foot-pounds would fall upon the surface.

THE Magnet Test, for detecting flaws in wrought iron, discovered by Mr. Saxby, and already referred to, continues to be applied practically with great success. A recent use of the process was in a gun factory, to ascertain the existence of weak places in barrels, which it pointed out with the greatest facility, although no external indications could be perceived. Similar spots in boiler-plate are also unerringly indicated in a similar manner.

White Pine.

To the Editor—Sir:

WITHOUT the disposition to mount any particular hobby with regard to the formation of White Pine, from which I might be ingloriously thrown by the force of new facts, developed by the energetic and rapid operations now going forward, I venture to say that the suggestions of theory contained in my last year's report to Congress are not yet proved false. Distinctly marked deep-fissure veins are not yet certainly known to exist upon Treasure Hill; although, on the other hand, their existence in that locality cannot be pronounced an impossibility. I shall not attempt to argue the subject at length, within the limits of a hasty letter. The great cry last year was: "Walls! let us find walls!" Walls have been found—too many of them for comfort, in fact. The whole body of the limestone is full of walls; but the question is not settled by this discovery. The Eberhardt mine, for instance, has a beautiful wall on the north, and a less complete but still traceable wall on the south, two hundred feet away; but it does not by any means follow that the ground between these is the filling of a fissure, two hundred feet wide. Suppose a third wall, of a similar kind, should be discovered on the west, between the Eberhardt and the Glacier! The thing is quite likely; since the walls already discovered may have no connection with each other, may be independent seams in the limestone, marking the lines along which the strata were broken in their elevation, the portion on one side being lifted more or less than the portion on the other side. The Eberhardt may therefore possibly be a fragment of an argentiferous stratum, the continuation of which to the north and south lies at an unknown greater depth, or once lay at a greater altitude, and has been entirely carried away by denudation. The strata are so clearly exposed on Treasure Hill, the Base Range, and White Pine Mountain, that a careful instrumental survey, coupled with close study of the lines of movement on the numerous slips and brakes in the limestone, can scarcely fail to throw much light upon the character of the metalliferous deposits in the three ranges, and their relation to each other. That some relation exists, I am more than ever convinced; and certain vague ideas of its nature I entertain; but I prefer to keep them to myself, and reserve the privilege of saying, "I always thought so," when some patient hand and clear head shall have wrought out the problem.

Other mines than the Eberhardt approach the appearance of contact deposits, lying in the limestone, sometimes adjoining, sometimes very near certain belts of arenaceous or argillaceous slates. The Hidden Treasure and the Mammoth are examples, and the California, a couple of miles south, and many hundred feet lower down, is another. These slates crop out in place around the summit of Treasure Hill, under the crown of encrinitic, carboniferous limestone. (No, my dear Professor ——, you need not look for coal here, because the limestone is carboniferous. These are deep-sea strata, slightly bituminous, if you like, from excess of sea-weed in some fruitful seasons, but not combustible. They were born to be drowned, or rather drowned before they were born; and they won't burn! Go further north and east, and find the places that were out of water when these were a thousand fathoms under it, and there prognosticate your theory! But to return to our slates.) If it can be shown, by careful examination, that this belt of about one hundred feet in thickness is unique and characteristic, it will form an admirable geological horizon, to which the strata of limestone may be referred, and their relative elevation determined; for the slates appear in numerous localities around Treasure Hill, at very different heights, though the solid exposure of several hundred feet of the edges of the limestone layers, on the east side of the hill, does not exhibit any slates in place. It will be interesting to inquire whether the hanging wall of the California, which has, where now exposed, a far more clayey character, is the same layer of slates, or some other stratum, not elsewhere discovered hitherto. Mr. J. E. Clayton has been pursuing for some time, with much industry and enthusiasm, investigations of the character indicated. In addition to the stratigraphical evidence, he has attempted to identify different layers of limestone by their lithological characters and their leading fossils. No doubt all these methods should be employed; but for the present the crying necessity is an instrumental measurement of the course, dip, and thickness of the different exposures; next to that, a careful and exhaustive tracing of the slates overlying the argentiferous limestone; and then a cautious verification of lithological and palæontological characters. The latter evidence is largely vitiated by the unequal silicification of the limestone in the same layer; and I apprehend that Mr. Clayton, though pursuing an eminently intelligent method of observation, has been led to hasty conclusions, and will be led hereafter to revise his own theory in its details. Moreover, it is not certain, until thoroughly proved by the collation of accurate measurements, that this, or any other suggested theory, is true at all; and, finally, it should be borne in mind that, while such a course may demonstrate the general nature of the White Pine deposits to be irregular, and related to certain strata of the limestone, even this result would not exclude the possibility of deep fissures among them, though it would so far indicate their improbability as to require strong evidence to establish their existence—evidence much stronger than a wall; for a wall does not make a vein, though a vein makes a wall.

The White Piners are apt to grow very angry and contemptuous over talk of this sort. Like all other miners, they want a man's "views;" but not unless his views confirm their own. There is a great deal of superstition among them about fissure veins. This was one of the earliest catch-words taken up by quack "Professors;" and every mine reported upon by that class of learned blacksmiths is considered to be worth a great deal, if it is pronounced a fissure, and nothing at all if dubbed a "deposit." People seem not to have learned that a big bunch is worth more than a little crevice. "Well; but the fissures extend forever in depth, you know." Perhaps they do, and perhaps they don't. When they don't, the "Professors" say they are not fissures, and get out of it that way. But for my part, I think there is some consolation in having your ore in a "deposit." If I were to choose whether I would take a chamber like that of the Eberhardt in width or in depth, I should say, with a view to dividends, give me width; though I confess that for purposes of stock speculation, depth is better.

The great advantage of White Pine, to-day, is the abundance of its surface ores, easily mined, easily and cheaply reduced. There is a disadvantage, of course, in not being able to open ground in regular style, and calculate upon the amount of ore which it will produce; there is a disadvantage in the uncertainty which prevails concerning the extent of the deposits in depth; and there is a great disadvantage in the vagueness of the title based under the laws of the district upon property of unknown description. But no silver mines that I know of in this country carry uniformly diffused good ore; and it is a matter of uncertainty in all cases what a given piece of ground will produce, until it has actually been laid open. As to titles, my opinion remains what it has always been. The White Pine system is absurd; but, on the other hand, it has been virtually modified by agreements and compromises among parties, so that the expected crop of litigation and violence has not sprung up.

Finally, the extent of these deposits, or veins, or whatever they are (I know, but I shall not tell!) seems to be very great. The works of the Eberhardt are already 190 feet deep; and, although the ore below is not quite as rich as that marvellous body exposed last year, it is valuable ore, and indicates a continuance of the deposit, at least so far as work has gone. Explorations in the neighborhood have brought to light promising outcrops on the Base Range and White Pine Mountain. Bullion Hill, oppcsite Hamilton, has furnished some splendid chloride ore, and districts more remote, to the south and west, are resonant with picking, and blasting, and boasting, beneath which there is perhaps more than the ordinary foundation of argentiferous rock. Even to the north, between Elko and White Pine, a gold district has been located, of which sharp Charley Bonner, of Virginia City, expresses a high opinion. You see White Pine and its neighborhood are likely to be lively for a good while.

Meanwhile, the three cities, Hamilton, Treasure, and Silon Springs, *alias* Shermantown, containing altogether about 10,000 inhabitants, are remarkably industrious and orderly. Things have already assumed the appearance of work. Mills are going up on every hand; and, while there is possibly danger of overdoing, as usual, the mill-building business, it must be confessed that there is just now a glut of ore waiting for reduction.

It is useless to warn any one to be cautious, I suppose. Yet, brilliant as are the prospects of White Pine, those who are not cautious will find themselves burned in the blaze. And even the best mines in the district will sooner or later find the wisdom of economy. Already the price of labor (fixed by a miner's league at $5 gold per day) is felt to be burdensome. Taking out chloride at that price is pretty good fun; but running drifts and sinking shafts in dead rock is tragical It may be set down as a universal fact that no mining district ever did or ever will produce only first-class ore; and when you hear of nothing but high returns from mills and furnaces, depend upon it, it is a bad sign. White Pine, far from being an exception, is an illustrious example of this rule. Some $10,000 ore; more $1000 ore; still more $500 ore; much more $100 ore; and a vast unmeasured quantity of $50, $40, $30, $20 ore, and so on down to absolute barrenness. The basis of future and permanent prosperity, here as everywhere in mining, must be the working of the low-grade ores. The lower the better; and the lower *now* the better; since all this skimming off the cream leaves the remainder poorer. And so White Pine, like every other mining district on this coast, is face to face with the labor question, of which you will hear more fully from me hereafter. R.

ARGENTA, July, 1869.

Water as Fuel.

ACCORDING to the *Pittsburg Commercial*, a young genius of that city has invented a furnace, in which a pan of water is so arranged that the oxygen of the water is brought to a volatile state. This is, by some suitable means, discharged into the furnace-fire, and thus renders combustion complete. By this means there is nearly if not quite fifty per cent of fuel saved. We happen to remember, about thirty years ago, that this identical arrangement was invented in Europe. Its merits were thoroughly investigated and tested, and the anticipated economy not only proved to be an illusion, but, instead of economy, there was rather a decided loss. This is just what might have been expected, as is well known to all who are aware of the fact that water is nothing but a product of combustion—in other words, burnt-up hydrogen. This cannot be, either burnt, or made to produce heat a second time, without having first given back the heat with which it had parted when the hydrogen burned. This rendering back of heat may be effected in the form of an electric current, or by means of a high temperature, etc. But without this it is absurd and unscientific to expect a substance to give out heat from which the heat has been expelled.

Submarine Railways.

IT is sixty years since Trevithick, undeterred by the unsuccessful attempt of Ralph Dodd, began a tunnel under the Thames, working from the Rotherhithe shore. He carried it upward of 1000 feet under the river, and to within 100 feet or so from the Middlesex bank, when the result of a rash experiment, undertaken by himself, was to flood the works with water. The history of the present Thames Tunnel, now about to become a railway tunnel, is sufficiently well known, and it is also well known that the Botallick mine, in Cornwall, extends for some distance beneath the Atlantic, and it is said that the miners can hear the roar of the waves, or at least the crashing roll of the shingle over their heads during storms. Our own columns have contained full accounts of the most important example of tunnelling beneath water—namely, the Chicago Lake Tunnel, extending for two miles beneath Lake Michigan, and to a point over which the water is 40 feet deep, the tunnel itself being 70 feet beneath the surface of the lake. This work was carried through a bed of imperviable clay previously bored at a number of points sufficient to establish its perfect continuity, and the tunnel was lined with brickwork as fast as the headings themselves were advanced. Here the work was, from the first, as reasonably certain of success as its subsequent progress was easy and straightforward.

The grandest example of subaqueous tunnelling, should it ever be carried out, will be the submarine railway from the South-Foreland to the French coast, near Calais. The under sea portion will be 22 miles in length (of course without shafts) under water of a maximum depth of nearly 200 feet at high tides, and at a distance or depth of from 250 feet to 320 feet beneath the bottom of the Channel. A question of great present interest is, Can this tunnel be made? It is well-nigh settled, beyond geological dispute, that there is no continuous bed of clay through which it can be carried unless through a comparatively thin bed of gault of uncertain dip and direction—a bed which, from such examination as it has been possible to make, appears to crop out across the bottom of the Channel between Abbot's Cliff and Cape Blanc-nez. The designers of the Channel Tunnel have preferred, therefore, the lower or gray chalk, and have proposed a line two or three miles only to the northeast of the outcrop just named, with its superior outcrop of green sand. The dip, to the northeastward of all the strata, is quietly estimated at 100 feet per mile, although there is not an authenticated axial (longitudinal) section of the Channel in existence, to show what is the real declension, to the northeastward of the strata of its bed. The proposed tunnel would pass under the deepest part of the Channel, between Dungeness and the North-Foreland, while it would not permit of the shortest crossing, possibly and probably because the shortest crossing is not practicable for a submarine tunnel. One enterprising projector would carry a tunnel through the green sand but those who would carry it through the chalk would still be sailing very close to the wind, with the certainty that, if a "fault" or fissure were met with, an irresistible stream of water, under from 200 pound to 225 pound pressure per square inch, would quickly dispose of all the work previously done. There are large, unmistakable, and well-recorded faults in the chalk beneath London, and, what with seismotive action—and we *do* hear of earthquakes even in England—there may be larger faults beneath the Channel. That men can be found, by hundreds, to work the headings of a Channel tunnel, need raise no doubt whatever. But that these men would ever come out of the headings, dead or alive, is another matter. If the headings once fail, all hope is well-nigh lost. It is proposed, by the engineers to the International Commission, to make two headings from each coast, each 9 feet square. Two headings are proposed, upon an assigned theory of ventilation, but it is clear that a single heading can be perfectly ventilated by compressed air, while it is certain that two parallel headings would but double the risk without economizing time. With a single heading 9 feet square, once safely carried through, there would be no great difficulty in enlarging it to a tunnel 28 feet or 30 feet wide. But the roof of this heading, occupying, perhaps, five years in making it, would present a surface for percolation of 24 or 25 acres, and it could not be bricked up as the work proceeded. One, two, or three years after a portion of the heading had been completed, a resistless torrent of water might suddenly come through, destroying, not only the whole work, but all within it. To undertake such a work, even if it be not tempting Providence, is, at least, to incur tremendous uncertainties, considering that it would be through a comparatively unexamined bed of chalk, but two or three miles from the outcrop of half a dozen strata.

But supposing the heading, or a parallel pair of headings, once made, and the tunnel afterward made, as it could then easily be made, there would not only be nearly 30 miles of continuous tunnel for the passenger, but this would be upon a line involving a long circuitous route to Paris. If Paris be the "objective point," it would be at least 25 miles further from London *via* Dover, by Mr. Hawkshaw's, than by Mr. Fowler's route, the latter a steamboat route. From London to Dover is 78 miles by the Chatham and Dover, and 76½ miles (*via* Sevenoaks) by the South Eastern. To Folkestone the distance is 71 miles only. Yet the proposed tunnel is to be carried well to the east of Dover—say, to the South-Foreland, and, instead of being directed well into the course of the Belgian and North German traffic, it draws short of Calais, and connects more directly with the line between Calais and Boulogne, making it well-nigh the most roundabout route between London and Paris.

The Channel Tunnel, estimated at $65,000,000, involving an interest charge, at 4 per cent, of more than $1300 per day, of 313 working days per year, would admit of any traffic, however extensive, and would conduct it at the average working rate of 35 or 40 miles per hour, without detention by tides, fogs, storms, or the chances of collisions. It is doubtful whether it can be made, equally doubtful whether it could ever "pay," except in the far distant future, with trains every quarter of an hour. That all trains would require to be lowered 500 feet or 520 feet at each end, and again pulled up through the same distance, is by no means an insuperable objection to the tunnel. Nor do we apprehend any insuperable difficulties in the way of draining or ventilating. Both, for any thing we can see, may be easily, successfully, and permanently managed.

On the other hand, an absolutely certain means of communication, for which nature has provided the "permanent way," if that term may be applied to a tidal sea, is already to be found between Folkestone and Cape Gris-nez, Audrecelles, Ambleteuse, or Boulogne. The shorter the sea passage desired, the nearer must the route bear toward Cape Gris-nez. Indeed, Dover pier and Cape Gris-nez are separated by the least distance of any points between England and the Continent, say 17½ knots. But Cape Gris-nez would not make a good landing-place for steamers, and so, for the Belgian and German traffic, the route would require to be drawn more toward Calais, and so, for Paris, it would require to be drawn more toward Boulogne. Of all the existing routes, they are diagonals between two nearly parallel coasts; in fact, there is no direct route across.

The railway ferry-boats, proposed by Messrs. Fowler and Wilson, would cross between Dover and Audrecelles, the latter about seven miles north of Boulogne. By leaving Folkestone instead of Dover, they would save from 5½ to 7 miles of land journeying on the English side, and by making the French port a short distance south of Cape Gris-nez, about two miles north of Audrecelles, they would reduce the sea journey to less than that now attending the Dover and Calais route. To the point named (or, rather, not named, as bearing no name) the steam service between England and France would be well-nigh the shortest practicable. Four or five miles of railway on the French side would connect it with the existing Calais and Boulogne Railway, one of the crookedest and worst in France, except between the proposed point of junction and Boulogne. It would be objected that this route would take vessels across the "Varne" and the "Ridge," or "Le Colbert," the most dreaded sand-banks, next to the Goodwins, of all in the Channel. But by planting a sufficiently visible beacon on the head of the Varne, a course might be taken to the northeast of it which would, at low-water spring-tides, carry over a vessel drawing 24 feet, with more than 40 feet of water over the northeastern end, or head, of the "Ridge."

The tunnel, estimated to cost $65,000,000, and attended with an interest burden of $8287 per day, might, for twenty trains each way daily, be worked at a cost of less than $1300 per day. To perform the same service, probably ten boats, costing each $650,000, would be required, and it is not perhaps far out of the way to allow $6,500,000 for the improvement of the ports of Folkestone, and the inchoate port south of Cape Gris-nez, but a little north of Audrecelles. Upon these would rest the interest at 5 per cent of $650,000 per annum, together with a further sum of $650,000 per annum for depreciation on boats. Beyond these sums would be the cost of repairs of boats, say $325,000, besides coal, wages, etc., bringing the whole, probably, up to nearly or quite $1,950,000. The boats would not prevent sea-sickness, and they would be more or less exposed to the risks of collision. They might run aground, especially in shallow harbors and at low tide, and, however fast they might be as boats, they would be slow as compared with railway-trains, the more so as they would require a considerable interval of time in receiving and discharging their deck-load of passenger and goods carriages. Still, this brief examination by no means exhausts the subject.—*Engineering.*

Exploring Expeditions in the North Polar Regions.

DR. PETERMANN, of Gotha, has prepared an account of five polar expeditions which are now in the high latitudes. Of these expeditions, three are German and two English, and seven vessels are employed. The first expedition is that of A. Rosenthal, with the screw-steamer *Bienenkorb*, of four hundred tons and sixty-five horse-power, and a crew of fifty-five persons, under Captain Hagens. This vessel is provisioned for from eight to twelve months. Dr. F. J. Dorst, of Jülich, is the geographer and astronomer of the expedition and the object of research is the sea between Greenland and Spitzbergen, as far as Gillis Land. The expedition sailed from Bremerhaven on the 21st of February last. A letter, dated May 9th, has been received in Gotha from Doctor Dorst, who dates from 74° north latitude, about one hundred miles from the East-Greenland coast, and reports an average seal season; in some parts rich catches have been made.

The second expedition is Lamont's, with a perfectly new screw-steamer, the *Diana*, built purposely for the voyage. She is two hundred and fifty tons burthen, and is provisioned for two years. Mr. Lamont is a member of the British Parliament, and is well known as a thorough seaman and good geologist. Dr. Smith accompanies him as naturalist, and Hamilton Macallum as painter. His goal is the sea between Spitzbergen and Nova Zembla, and he will also explore Gillis Land. He sailed from England on the 20th of April. The third expedition is Captain Palliser's. He has a sailing-schooner, with a steam-yawl on board. In 1868, Captain Palliser spent three months on Spitzbergen, engaged in hunting; but as that island did not satisfy him, he now goes to Nova Zembla, and will explore the still almost unknown sea between Spitzbergen and that island. He sailed from England in April.

The fourth expedition is A. Rosenthal's screw-steamer *Albert*, of seven hundred tons and ninety-horse power, with a crew of seventy persons, under Captain Hashagen. This vessel is provisioned for fifteen months, and has nearly five hundred tons of coal on board. Dr. Emil Bessels, of Heidelberg, is zoologist and sketcher. The object of this expedition is to sail around Spitzbergen, to explore Gillis Land and the sea between Spitzbergen and Nova Zembla, and to penetrate to the most northern latitude possible, following along the Siberian coast in search of deposits of mammoth remains, etc. This expedition sailed from Bremerhaven on the 23d of May. The fifth is the second German North Polar Expedition. It consists of the screw-steamer *Germania* and the sailing-vessel *Hansa*. The scientific force of this expedition includes Drs. Börgen, Buchholz, Copeland, Laube, Pausch, and Payer. The chief vessel is under the command of Captain Koldeweg. The object is the exploration of the Arctic central region, on the basis of East Greenland; the solving of the polar question; the measurement of latitudes, etc. The vessels left Bremerhaven on the 15th of June.—*Evening Post.*

A New Hot Spring.

A STRANGE geological phenomenon caused some excitement recently at Murat, a village situated between the valley of Mont Dore and that of St. James. A civil engineer had caused a rectangular well to be sunk to a depth of 53 metres through a stratum of hard tufa, which covers the primitive formation in that district. At this depth, which is insignificant compared to the shaft of a mine, the heat, nevertheless, became so intense that the workmen had to be relieved at short intervals. Their wooden shoes soon got intolerably warm, and they could not lie down to rest themselves on the hot ground. On the other hand, the appearance of the tufa denoted that the well had nearly reached the granite. The engineer, on leaving the spot for a while, had recommended his men to be very careful during his absence, and to content themselves with removing the rubble, without going further down. One of them, however, in throwing the last shovelful into the skip, took it into his head to remove with his pickaxe a piece of tufa, about 30 inches in circumference; but no sooner had he done this than he saw the bottom of the hole he had made swell up. At the same time a loud, rumbling noise was heard. The men in a fright jumped into the cage and called to be pulled up; but they had barely got to a height of a dozen metres when a thick column of hot water, preceded by a violent report, rose up in the air, projecting huge stones upward. The water in falling scalded the men grievously. The jet diminished, and the well filled rapidly, the poor fellows succeeding, however, in getting out in time. In the course of ten hours the well got quite full, and from that time a rivulet of thermal water has been flowing from the spot into the Dordogne. The liquid, on arriving there, still retains a temperature of 40° Centigrade. Upon analysis, it has been found to contain upward of 20 milligrammes (nearly half a grain) of arseniate of potash per litre, a proportion unheard of before.—*Mechanics' Magazine.*

The Hudson and East River Canal.

THE Hudson and Harlem River Canal Company was incorporated by the Legislature of 1863. Its charter authorized it to construct a canal, following the channel of the Spuyten Duyvil from the Hudson River to a point fixed by the directors. They determined this point to be where Two Hundred and Twenty-first and Two Hundred and Twenty-second streets strike the creek, and proposed to cross thence to the Harlem River at Ninth-avenue. The Legislature of 1864 amended the act so as to empower the company to extend their canal from a point on the Harlem River southeasterly of the Harlem Bridge to a point on Long Island Sound, and along such line, between such points as they may deem proper; obtaining consent of the Department of Public Charities and Correction, in case of interfering with the islands occupied by that department. The time for constructing the canal has been extended to the 2d of May, 1872, and the capital increased to $1,000,000. The canal will have a water surface of sixty feet, and be seven feet in depth. It will open a direct route of navigation from the Hudson River to Long Island Sound and the East River; and the directors propose to make it an important commercial thoroughfare. The shortening of distance which it will secure is an important item, especially now that the tendency of population, and probably of business, is so decidedly up-town.—*Evening Post.*

Queries.

F. C., OF COLORADO—Wishes information regarding the alloy of platinum and copper, said to be more similar to gold than any other. It consists of sixteen parts copper and seven parts of platinum, melted with borax flux, and coal; afterward, one part of zinc is added. It looks like the gold and copper alloy of 18-carat gold, and is not attacked by cold nitric acid. A similar alloy was sold lately in this city, in the well-known form of California gold-dust. The imitation was perfect. It changed hands several times, and the fraud was not discovered until it reached the hands of the assayer of the Government assay-office, of Wall-street.

MINING SUMMARY.

Nevada.

SEMI-ANNUAL STATISTICS OF THE BULLION PRODUCT, DIVIDENDS, AND ASSESSMENTS OF THE COMSTOCK MINES.

THE subjoined table of statistics relative to the mines on the Comstock lode is well worthy the attention of the mining public. The decrease in the bullion product, and the lack of dividends, and frequency of assessments, remind us of our prediction made nearly four years ago, in a series of articles, advocating the immediate consummation of the Sutro Tunnel, for the more thorough and economical working of the mines. We still remain firm in our convictions that nothing but a deep drain tunnel will save the Comstock mines from total supension.

Our tabular statements, taken from the San Francisco *Commercial Herald*, show the bullion product (so far as can be ascertained), dividends paid, and assessments levied during the first six months of 1869, together with the figures of previous like periods:

COMPANY.	Bullion Product.	Dividends.	Assessments.
Alpha,	.....	.....	$30,000
Belcher,	$8,280	.....	83,200
Bullion,	.....	.....	25,000
Crown Point,	105,718	.....	.....
Confidence,	18,889	.....	31,200
Choilar-Potosi,	665,637	$42,000	.....
Central,	.....	.....	4,500
Consolidated Virginia,	.....	.....	17,400
Daney,	.....	.....	48,000
Empire Mill & Mining Co.,	93,914	.....	.....
Gould & Curry,	53,796	.....	.....
Gold Hill Q. M. & M. Co.,	34,345	.....	10,000
Hale & Norcross,	447,511	96,000	.....
Imperial,	230,947	.....	.....
Justice,	.....	.....	15,000
Julia,	.....	.....	5,000
Kentuck,	243,772	40,000	20,000
Lady Bryan,	.....	.....	.....
Occidental,*	180,000	20,000	.....
Ophir,	.....	.....	50,400
Overman,	156,671	.....	128,000
Segregated Belcher,	4,859	.....	.....
Savage,	943,217	280,000	.....
Sierra Nevada,	88,165	7,000	.....
Yellow Jacket,*	680,000	360,000	.....
First 6 months, 1869,	$3,955,701	$845,500	$467,700
" " 1868,	4 299,488	1,100,150	938,100
" " 1867,	7,064,653	2,068,200	440,680
" " 1866,	4,926,708	526,000	687,400

* Estimated.

THE MINERS' STRIKE AT WHITE PINE.

OUR mail advices from Treasure City relate mainly to the miners' strike, the details of which we do not deem of sufficient importance to warrant their reproduction in our columns. It appears that the Eberhardt Company gave notice that they would pay no more than $4 a day to their workmen, instead of the old rate, which was $5. This caused a general turn-out of the Miners' Union, to the number of some 700 men. Before the Fourth of July there were scarcely 200 men in the league; but whispers about that time having gone the rounds to the effect that the Superintendents were about to reduce wages, very many miners at once joined the Union, and raised the number of members in a very few days to nearly 750.

It is thought that by letting out work by contract, which comes at a less rate than men at $4 per day, the miners' strike will come to a speedy end. Among the miners themselves there has already been fatal issue from the strike. One night's carousal resulted in the shooting of three men by a drunken miner.

THE STETEFELDT CHLORIDIZING ROASTING-FURNACE.

GUIDO KUSTEL, the eminent metallurgist, writes as follows in the San Francisco *Mining Press* on this new furnace recently brought out in Nevada: "The mechanical part of the roasting of silver ores in Stetefeldt's furnace is so simple that the whole manipulation is explained in a few words. The principal point is the maintenance of a uniform fire in two fireplaces, and a certain degree of pulverization. The ore must be carefully mixed with salt of equal fineness, which is best accomplished by crushing the ore together with the salt. The hopper is continually charged with the pulverized ore. The feeding is done by machinery, with great precision, by an improved arrangement.

"The chemical proceeding of the chlorination is very interesting. At the first glance, it would seem that, considering the short time of two seconds in which the falling ore is exposed to the flame, a perfect chlorination could not take place, especially if compared with the known facts apparent in the common roasting-furnace—that is, that sulphurous acid is first formed under influence of a dark-red heat, by aid of the oxygen of the air, while the metal, deprived of its sulphur, becomes an oxide. The oxygen of the air and of the oxide act on the sulphurous acid, converting it into sulphuric acid, which again combines with the metal oxide to a sulphate. The sulphate reacts now on the salt, setting the chlorine free, and the formation of chlorides begins.

"This reaction and transformation requires time, which is not offered in Stetefeldt's furnace; but the chlorination is effected nevertheless, and very perfectly, with less salt, and in a few seconds. The chemical action in Stetefeldt's furnace is as follows: As soon as the ore enters the furnace, each sulphuret particle ignites, being surrounded by a glowing atmosphere; evolving at the same time sulphur, which, in presence of atmospheric air entering undecomposed through the grates, is converted into sulphurous acid, and the metal into an oxide. In contact with ore particles and oxygen, the sulphurous acid becomes sulphuric acid. This acid does not combine with the metal oxide to a sulphate, as is the case in a common furnace, or if so, only to an insignificant degree, on account of the temperature, which, nearly from the start, is too high. The sulphuric acid, therefore, turns its force directly against the glowing salt particles, setting free the chlorine. All these reactions are, so to say, in *statu nascenti*. From the burning fuel some steam is present among the gases, giving rise to the formation of hydrochloric acid. The whole space of the furnace is then filled with glowing gases of chlorine, hydrochloric acid, sulphuric acid, sulphurous acid, oxygen, steam, and volatile base metal chlorides; all of them acting, decomposing and composing, on the sulphurets and oxides with great energy. The chlorine decomposes the sulphurets directly, forming chloride of metal and chloride of sulphur; it decomposes and combines also with oxides and sulphates. The hydrochloric acid does the same. The sulphuric acid decomposes the salt and oxidizes the sulphurets, while the oxygen creates sulphurous and sulphuric acid and oxides. The red-hot ore falls down, and, accumulating, continues evolving gases of chlorine, etc.

"Considering, now, a minute particle of ore (for only as such, not as a mass, can the ore be considered in falling) in a red-hot state, being attacked contemporaneously by all those gases which have free access from all sides; the principle of the Stetefeldt furnace is, that the chloridizing result must be effected before the particle reaches the floor."

MINERS' STRIKE IN HUMBOLDT.

A CORRESPONDENT writing from Unionville, says: "Fall has just returned from San Francisco, and ordered that miners shall work ten hours, instead of nine. This the miners refuse to do, and have quit work. Stewart, of the Silver Mining Company, has gone to the mines to get his men to add an hour to their labors. This move is made by the mine-owners in order to introduce Chinese, as they know the miners will not work ten hours. They can say white men will not work for them, and they are compelled to employ coolies. The whole move was put up with this in view. I am of the opinion that this will prove a very warm climate for Chinamen yet."

LANDER HILL—THE BUEL NORTH STAR MINE.

THE following interesting account of this mine is taken from the *Reese River Reveille*, July 17th. It is a good while since we have said any thing in regard to the mines of the Reese River District. So completely has the public mind been absorbed by the wonderful discoveries of the past year at White Pine, that all interest was lost in every thing pertaining to mining that did not excite the imagination with recitals of new and marvellous places. In fact, save with those who were toiling in its bosom, Lander Hill, for the past six months, has been forgotten. And yet, during all this time, results were being accomplished which will tax the capacity of the much-vaunted new districts to equal. Says our contemporary:

"On last Tuesday we availed ourselves of the offer of Mr. C. C. Lane to give us a view of the bowels of Lander Hill, and, in company with him, descended to the lowest level of the Buel North Star mine, belonging to the Lane & Fuller Company, of which Mr. Lane is Superintendent. We are glad we did so, as it has warmed our hearts, and fully satisfied us that Austin is not only not about to die, but may live to sing the requiem of her now proud and sneering rivals. Not that we have any particular hankering to assist at any body's funeral; far from it—we had much rather assist at a wedding—but somehow or other we can't divest ourselves of the belief that the Comstock, of Virginia, the mines of the Reese River District, of Twin River and Silver Bend, are the only paying mines so far discovered in the State that have the requisite backbone to stand the pressure of long and continous working. This may be only a prejudice; we hope time may prove it to be nothing but that. But, however that may be, it has nothing to do with us, Mr. Lane, or the Buel North Star.

"About eighteen months ago Mr. C. C. Lane was appointed to the superintendency of the Buel North Star mine. It was not at that time a desirable position. Three former superintendents, all men of sound judgment, had been compelled to throw up the sponge, and the last one left the mine in an apparently hopeless condition, not a vestige of a vein being visible at the bottom of the incline. Various were the theories advanced by experts as to the cause of the break and the probable point at which the mine would be again found, but all these theories and speculations, on account of their diversity, only added to the confusion. The incline had reached a depth of four hundred feet when Mr. Lane took charge. He pushed it down a little further, but no sign of a vein was to be seen, and he concluded that sinking was not the way to find the lost vein. The Buel North Star ledge runs northwest and southeast and dips north. Contrary to general advice, Mr. Lane had a drift started from the bottom of the incline northwardly or into the hill. After running two hundred feet in this direction, a superb vein was struck, which subsequent tracings have demonstrated to be the identical vein lost in the incline. By some commotion in the hill, the vein had been divided and two hundred feet of granite separated the two parts.

"It is not our purpose to enter into a detailed history of the affairs of the Company; this would be of no interest to the general reader. We will simply give a *résumé* of Mr. Lane's operations since that time. The incline was abandoned shortly after, when a consolidation was effected between the Buel North Star and the Lane & Fuller companies, and the working of the mine was transferred to the perpendicular shaft of the latter, some distance higher up the hill, a drift having been run from the bottom of the shaft, connecting it with the works of the Buel North Star. All this drifting and moving of machinery necessarily entailed a considerable expense; but still, as ore was being extracted the company (a Boston company) has never been called upon for one dollar since the vein was struck, but, on the contrary, have had $52,000 (currency) sent them as dividends; whereas the total amount furnished by them, up to the time of the striking of the vein, was only $17,797.60 (coin). Considering the amount of dead work done, which has placed the mine in a position where it can be worked to profit, and the high price of crushing, we consider this a flattering result.

"At present the mine is in a fix which it does one good to look at. At four hundred feet perpendicular, the vein is exposed in the main drift on a length of 250 feet—that is, to the present western end of the drift—and shows an unbroken face varying from one to three feet in thickness of such ore as the mine has yielded heretofore, a sample of which may be seen in the huge blocks exposed in front of Mr. Riotte's assay office. The ground above this level has been sufficiently explored to make an estimate of the amount of ore now available comparatively easy. We think that 3000 tons may be said to be in sight, and that their yield will not be far from $600,000.

"The number of men employed in the mine is forty-five.

"This is not the only mine being worked on Lander Hill; several other parties in the neighborhood of the Buel North Star are working and preparing to work."

Colorado.

A GLANCE INTO THE FUTURE—GOLDEN CITY A METALLURGICAL AND MANUFACTURING CENTRE.

WE find in the Colorado *Transcript* the following communication from the well-known geologist, Professor F. V. Hayden, on the natural advantages of Golden City and the country immediately surrounding it. He says, addressing the editor: "The day that I spent in examining your interesting region afforded me so much pleasure, as well as instruction, that I have ventured to make a note of it for your paper. The readers of your paper are already well aware of the beautiful location of your town, the picturesqueness of the scenery around it, the fertility and productiveness of the soil, and the splendid water-power for manufacturing purposes, but it may be pleasant to them to know that strangers recognize these facts.

"The resources of your country have often been presented to the public, and I can add but little that is really new. The coal-beds in your vicinity are becoming more and more important every year. Five miles north of Golden City is the well-known Murphy Mine, with a bed of coal, of the best quality, eighteen feet in thickness. In due time, this bed may be opened all the way southward to your city. The mine near your town will also continue to be of great value, and the openings southward promise abundantly. The fuel question, one of the most important to this country, may be regarded as settled, so far as your county is concerned.

"The fire-clay and potters'-clay, which are so abundant and of such excellent quality, are fast becoming sources of revenue also. These clays are practically inexhaustible, and their full value has been but partially tested as yet.

"Your iron ores may yet become available, and although in your immediate vicinity they do not seem to be very rich, farther to the northward there is the greatest abundance of as fine brown hematite as can be found in any portion of the world. You have, therefore, an abundance of two of the most important minerals, in an economical point of view, that can be utilized by man.

"In connection with this fuel question, an important thought has been suggested to me, while studying the wonderfully rich silver-mines in and around Georgetown. In a few years, the scanty supply of wood for fuel in the mountains will be exhausted, and the vast quantities of silver ores, which will be taken from these mines for years to come, must be brought down from the mountains to a point where cheap fuel can be obtained. With the abundant facilities which you possess for such a purpose, it would not be a matter of surprise if, within a short period, gigantic works for smelting ores were erected near your city. The most enterprising of the mining men in the silver districts are looking forward to the erection of smelting-furnaces, at no distant day, somewhere along the base of the mountains, near the coal-beds.

"One of the most interesting features that I observed in a geological point of view, and one that adds very much to the beauty of your scenery, are the table-mountains. These are outbursts of volcanic material, or dykes, and, with the exception of a long dyke near Valmont, in Boulder Valley, are new features along the eastern flanks of the mountains south of Sweetwater. It seems that the melted rock burst through the overlying sedimentary formations, which were nearly horizontal, and flowed over them, and thus a bed of basalt was formed, which protected the underlying rocks from being swept away by erosion. There is no doubt that the two table-hills were once united, but that Clear Creek has worn its way through them. The underlying sedimentary beds are of the same age as those containing the coal, and there is no visible reason why coal may not yet be discovered in them.

"In looking at the valley of Clear Creek from the summit of one of these table-mountains, it seemed to me that I could cast my eye over the most beautiful and productive cultivated farms in Colorado. In all countries, the soil composed of the eroded materials of igneous or basaltic rocks, possesses extraordinary fertility, and the soil of this valley is largely composed of the worn basaltic rocks which form the dykes in this vicinity. The valley of Clear Creek must ever be noted among the many beautiful and fertile valleys of Colorado for its fertility and productiveness. With the multiplicity of resources in your possession, your fine water-power and favorable location, with the well-known energy and intelligence of its citizens, it seems to me Golden City must continue to be, as it has been, one of the most prosperous and growing cities in the West."

MISCELLANEOUS MINING ITEMS.

WE condense from our exchanges the following interesting items of mining news:

A telegram from Central City says that mining matters are very prosperous. The Cooley lode has a seven-inch crevice of silver, that sells for $350 per ton, twenty-five tons of which have been taken out in the past five weeks, at an expense of $1400. The last shipment of the Smith & Parmelee Company amounted to 179 ounces of gold, the product of six days' run from second-class ore—currency value, $4200—at an expense of $1600. They get $125 per ton for first-class ore. Bullion shipments for the month of July will foot up about $260,000.

The *Register* is informed that the ore in the Consolidated Gregory Company's mine has been steadily improving in quality for some time past, and that it now runs from five to six ounces per cord. This is a marked improvement from last winter, and is nearly or quite up to an average yield of the stamp-ore from the Gregory lode.

According to the Georgetown *Miner*, the work of development on the Silver Eagle and Omaha lodes, situated on Republican Mountain, is going on bravely. The Omaha is a well-defined vein four feet wide, and has a shaft on it about fifty feet. The ore at the dump shows well, and indicates that rich pay is not far off. The Silver Eagle has a shaft forty feet. A level has been driven from the west, where the ground descends rapidly, to intersect the shaft—a distance of about one hundred feet. The walls are smooth and permanent, and the deposit of vein-matter is about five feet wide. The following results have been obtained by fire-assay, as depth was gained on the lode: $370, $400, $650, $1300, and $2000 per ton, coin value. A test run of surface-ore was made, some time since, at the reduction-works, then under the control of Professor Martine, which yielded at the rate of $200 per ton in silver, coin value. Forty pounds of selected ore has just been treated by John T. Harris, and $1060 per ton, coin value, was the result. Five tons are now at Stewart's reduction-works for treatment. The above property is owned by the Mercer Gold and Silver Mining Company of Colorado, William Amsbary, Superintendent. Thus far, the yield of silver from the mine has paid for all cost of mining, treatment of ores, etc.

The Georgetown *Miner* has also an account of the progress of operations on the lodes of Snow Drift Mountains. The Snow Drift lode is the first mentioned. Sufficient work has been done upon it to convince any one that it is a large, well-defined, continuous, true fissure vein, with permanent, smooth walls. The whole number of feet sunk and drifted on the lode is 627. In all the levels, shafts, and cuts, the deposit of vein-matter is large and continuous. The vein-matter is generally decomposed and easily worked. Assays of $5000 per ton have been obtained from selected specimens of ore from this lode. The average yield of the whole crevice is $195 per ton. The west half of the Snow Drift lode is owned by the Silver

Lead Mining Company, George W. Cox, Superintendent; and the east half is owned by the Trenton Gold and Silver Mining Company, Jacob Snyder, General Superintendent. The Trenton Company have selected and preëmpted a valuable water-power on the creek, almost immediately below their mine, and will, as soon as some important matters are settled in regard to the mine, erect large reduction-works. Work on the Lee lode, also belonging to the Trenton Company, will commence in a short time.

The Boulder *Pioneer* learns that William Brierly has just received from Bottolfson's mill, at Gold Hill, twenty-three ounces of gold, as the product of two cords of ore from the Rip Van Winkle lode, the first crushed from it. This gold is worth $20 per ounce, and was taken out by two men in eighteen days. Mr. Brierly had also one fifth of a cord of ore worked from the Williams lode, which paid at the rate of eight ounces per cord. Mr. George W. Carter had seven eighths of a cord of ore worked at the same mill last week, which gave eight and three fourths ounces of good retort. This was surface-ore, taken from different lodes.

Pennsylvania.

AFFAIRS IN THE COAL DISTRICTS—CHINESE MINERS.

THE Shamokin *Herald*, July 22d, says of the Northumberland County coal trade:

"Every colliery in our region is in full operation, and it is quite certain that the July shipments in our county will exceed any past shipment. There were some few misunderstandings between the miners and operators of several collieries, but we believe these differences have all been satisfactorily adjusted.

"Some of the coal companies in Luzerne and Carbon Counties propose employing Chinese as miners, as an experiment. We predict that within seven years John Chinaman will be a toiling miner in the Shamokin region."

IMPORTANT OIL STRIKE.

THE Titusville *Herald* records the striking of a well near Shamburg which produces green oil—the other wells in that vicinity all producing black oil, like that of Pleasantville. It says the well on Lease No. 57, on the Pittsburg and Cherry Run Oil Company's tract, struck some three weeks ago in the black oil shell, which produced at the start about fifty barrels per day of black oil, fell off in production in the course of the ensuing week no less than ten barrels per day, and it was decided to drill it deeper and in the fifth sand rock. This has been accomplished in the interval, and on Friday morning last the well was retubed and pumped, when an entirely different oil from its previous production made its appearance—being nothing more nor less than light-green oil of the same quality as that found on the Tallman and Atkinson farms, perfectly pure and free from any appearances of black oil. The production of the well is variously estimated at from 100 to 125 barrels per day, and appears to be steadily increasing. The working interest is owned by Messrs. O'Hara and McFarland, of Shamburg. The striking of green oil in this immediate vicinity, in the midst of black-oil wells pumping from the same sand rock, is an occurrence of an unprecedented character, and naturally occasions quite a stir among the operators.

NEW EXPERIMENTAL STEEL WORKS.

IT has been hitherto announced that experimental works are being erected at the Henry Clay Furnaces in Reading, for the purpose of making steel by a new method, originated by a Mr. Hamer, at a much less cost than by the Bessemer process. We clip the following from the Allentown *Lehigh Register* in relation to this project:

"Several Montgomery County and Philadelphia gentlemen—among whom are Messrs. Richard S. Newbold, of the Eagle Works, Norristown; D. O. & H. S. Hitner, of Spring Mills; and Hon. John Wood and Colonel Jeffreys, of Conshohocken—are about testing a new process for manufacturing steel, and the necessary works are being constructed at Eckert's Iron Works in Reading, for that purpose. By this process, it is claimed, steel can be manufactured here at much less cost than the Bessemer steel. The result of this test, if successful, will have great effect upon the manufacture of steel rails, and completely shut out from the market all foreign rails. These gentlemen will have the sole right to manufacture by this process in Pennsylvania, and in order to test it thoroughly the trial works are to be made capable of turning out six thousand tons of steel a year."

NEW FURNACE.

WE find in the Allentown *Democrat* the following account of the new iron furnace near that place, which, when finished, will be the most complete in the Lehigh Valley: "The new Lehigh furnace, below the Junction at this place, originally called the 'Miyunga,' is now entirely completed, and will go into operation this week, the process of filling the stack having already been commenced. The stack is a monster in its proportions, being fifteen feet across the bosh, and in height from hearthstone to top of cupola, fifty-six feet, the outside iron and the inside encased with fire-brick, making it one of the largest and most complete single furnaces in the country. Besides the stack, every thing connected with the new furnace is of grand proportions. The engine, a lever beam condensing, is of five-hundred horse-power, made by I. P. Morris & Co., Philadelphia, with blowing apparatus, etc., of corresponding magnitude. The fly-wheels alone weigh 58,000 pounds, being twenty-four feet in diameter. All the machinery, castings, etc., are of first-class make. The stack-house attached is the largest and best arranged of any furnace in the Valley. The establishment is calculated to run forty tons of pig daily. The Company is made up of only twelve stockholders, among them E. J. Hart, Esq., of New-Orleans, who, we understand, is very largely interested."

California.

COPPER MINING IN MARIPOSA.

THE Mariposa *Gazette*, of July 16th, says: "The Buchanan copper mine, at Buchanan, Fresno County, is still yielding a large amount of copper. The company employ about twenty-five men, and take out eighteen tons of ore per day. The main shaft is now down 140 feet, and, after sinking 100 feet more, they intend drifting north and south, and increase the amount taken out to forty tons per day. At the bottom of the present shaft, the vein is some ten feet in width, half of which is twenty per cent copper. They have a pit of one hundred and twenty-five tons of ore now roasting, and another of three hundred and fifty tons under construction. The company is in a flourishing condition, and we hope it may continue so."

HITE'S QUARTZ-MILL.

THE editor of the Mariposa *Mail*, writing from Hite's Cove, under date of July 14th, gives a long and full description of Hite's quartz mine and mill, wherein the manner of proceeding at that mill is elaborately described, closing in the following words:

"From the sluice, the remaining sands and sulphurets are taken and piled up, with a view to regrinding the same; salt is mixed with them, and, after several months' exposure to the weather, the sulphurets become rusted and decayed, so that a second grinding secures about all the gold. Several tests have been made of these sands, which have assayed from $300 to $548 per ton—the latter sum was the last test made. The great freshet of 1867, which carried away the mill, washed away upward of two thousand tons of these valuable sands, which was the most material loss to the owners."

Estimating the sands that were washed away at the lowest of the above assays, the loss (two thousand tons, at $300, equals $600,000) would certainly appear to be sufficiently material for almost any single enterprise of the kind to stand at one fell blow.

THE NEVADA COUNTY MINES—BLASTING EXPERIMENTS.

THE managers of the Empire Mine are making some experiments in blasting with the quality of gunpowder known as rifle-powder. This was put up in cartridges, and rammed down in the hole made by a three-quarter-inch drill, and threw out the rock well. The experiments will be continued. An agent of one of the powder companies of San Francisco is conducting the experiments. We understand that gun-cotton, of improved manufacture, will soon be tested in these mines.

The Banner Mine has started on the old basis, with black powder and double-handed drills.

The Eureka cleaned up, after a run of ten days, $22,300. The bricks, which weighed 1260 ounces, were sent down to San Francisco.

Twenty-three loads of rock from New-York Hill paid over $22 per load.

The Idaho mill, after a run of two weeks, with fifteen stamps, cleaned up $14,000.

The work of intimidation and assassination at Grass Valley has been inaugurated by the giant powder-strikers. Several miners have been dangerously wounded.

Idaho.

IMMENSE LEAD LODE.

THE Silver City *Avalanche*, July 24th, has the following account of the immense lead lode now in progress of development at South Mountain, situated about twenty-four miles south of Silver City:

"The formation of the north half of the mountain is granite, the south half lime and marble. There has been found in this mountain an immense lead lode, running southeasterly and northwesterly, finely cased in lime or spar—the same grades of rock peculiar to the deposits of White Pine. This lead has been shown in the works of Wessels & Hardy to be 44 feet wide, the same in the Picket, Cumorow & Grayson works, so far as indicated in their stripping. I have assays of the lead, yielding in silver from $137 to $266; have been informed that a dark iron-colored rock shown me, which abounds in the vein matter, assays $300 in silver. The components of the vein are lead, iron, copper, and black sulphuretted quartz conglomerated—the last, the lead and copper in nodules, while the iron has good vein shape."

FLINT DISTRICT.

THE same paper says that the White Pine excitement has disorganized mining affairs in Flint District. Eastern men are, however, looking into the mines there. Two capitalists from Chicago worked two tons of Sherman rock recently, which resulted in their obtaining $538 in silver. Six tons Jacob Astor yielded $210 per ton.

THE GREAT WAR EAGLE TUNNEL.

THIS gigantic and praiseworthy enterprise, of which considerable has been said for a year or more past, is not receiving that assistance from capitalists which it certainly deserves. Mr. Robbins, the projector, is, however, still hopeful and determined, and when the White Pine fever cools down he will undoubtedly receive sufficient aid from capitalists to push the tunnel forward.

A NEW DISCOVERY.

SOME excitement was caused in Silver City recently, by the discovery of a rich ledge near the head of Whiskey Gulch. It is called the Home Resort. Specimens from it show plenty of free gold. It is the opinion of those who have visited the ledge, that it will develop well, and that it is, in short, a "big thing." The lucky claimants are Chauncey and Hyman & Reichenberg. Several extensions have been taken up and recorded; work is being pushed forward as rapidly as possible on the original discovery.

Montana.

GREEN CAMPBELL LODE.

THE Virginia City *Republican*, July 24th, says: "A shipment was made from this lode a few days ago, amounting to $9000, and another on Tuesday of this week, amounting to $6000. There is already 1500 tons out ready for the mill. Dr. Everett informs us that they commenced tunnelling on Tuesday, and will strike the lode at the depth of 100 feet. By drifting a depth of 300 will be attained. The crevice is from nine to fifteen feet in width, the paying portion of which is about six feet. The exact yield is not known, but it will average at least $20 to the ton, by the present process. The Company expect new machinery for working the quartz, by which this yield will probably be doubled. The lode is undoubtedly the most permanent and promising in the Territory."

FROM GALLATIN.

MR. FARWELL, recently from this locality, reports that there is a prosperous business in placer mining at Washington Gulch. Some thirty or forty men are engaged there, with fair prospects of good success.

On the hill adjacent to Sterling, parties are collecting rock from the surface, which by mill-working pays $40 to the ton. The men are prospecting with the expectation of finding a large and rich lode. The quartz is being crushed in Hobart's mill.

About three miles below Sterling, Mr. Bradley is crushing in his arastra, rock which pays two ounces to the ton.

Half a mile below Bradley's an arastra is crushing rock taken from the surface near the Red Bluff lode, which is paying a good dividend.

Hall & Spaulding's quartz-mill is running with great success near Sterling, on Meadow Creek. The ore is taken from the Mother Hendricks lode.

ARGENTA.

MAJOR VEALE states that mining affairs at this place are looking up. In his furnace and mines constant employment is given to fifteen men night and day, and about as many more in the Tootle & Leach furnace. The Atlantic Cable lode has been worked to the depth of 60 feet, the Eton 110 feet, and the owners of lodes in the vicinity have all re-commenced work with a hearty good-will. Messrs. Cummings & Veale have commenced a new run in their furnace, the metal from the last being now in process of cupellation. There is nothing to prevent the constant operation of the two furnaces; and the lodes, so far as developed, give increasing evidence of permanency and richness.

Michigan.

THE KEWEENAW COPPER MINES.

TELEGRAPHIC correspondence of the Houghton *Gazette*, bearing date July 22d, communicates the following intelligence touching the mines of this district: "The explorations on the southern range of the Cliff property are being prosecuted with great success. Several very promising veins, amygdaloid belts, and those said conglomerates have been found. Specimens of the conglomerate resemble the Allouez, and appear rich in copper.

"At the mine the 170 level is being pushed as fast as possible. Mass copper is not quite so abundant, but there is rich stamp-work in reasonable quantity. As soon as connections on the 170 are made, you may probably hear of some fair-sized masses.

"At the Phœnix Bay State vein, appearances are very encouraging. The Big Mass continues to hold good, and beyond question is the best mass ever found on the lake. Grading for the new engine-house is finished preparatory to hoisting from Crocker shaft. Robbins vein is producing fair stamp and barrel work; no heavy masses to speak of. Workings on the ash-bed are suspended for the present. "Little tappers" at work night and day, and giving good satisfaction.

"Stoping on the 90-fathom level near the line of the ash-bed of the Copper Falls Mine, is being resumed with fair prospects, the removal of the 30-ton mass affording opportunities. Drifting on the 100-fathom level, south from Spencer shaft, has been commenced, and will not drive far before the course of copper is cut that is producing so well at 90. The stamps are idle, the mine relying wholly on mass and barrel work for its product.

"A force of twenty-five miners are employed in the Clark Mine, mostly on their last workings. Expect to increase as soon as Mr. Borie returns from below to take charge of affairs at the mine. A new feature at this point is the finding of heavy copper immediately under the Lake Shore conglomerate."

THE IRON MINES.

"NEGAUNEE, July 15th.

"THE weather has been favorable the last week, and the mines are alive with business. The water is all out of the shafts, and they are in good working condition. The Peninsula road is running seven ore-trains, and all hauling full loads."

Arizona.

THE mails from Arizona are nearly a month behind those of California in reaching this city. Although we have San Francisco papers bearing date July 24th, our latest exchanges from this Territory bear date June 26th! Taking into consideration the distance travelled by the two mails, and making due allowance for through railroad communication with San Francisco, we still cannot account for this great difference in time. Possibly the postal authorities can throw some light on this important point.

The Prescott *Miner* has these items of mining news: "A new and rich gulch has been struck in the vicinity of the Placeritas, near Walnut Grove. It is said that about twenty-four Mexicans are working in the gulch, and that they have taken out a great deal of gold. Several parties intend going down there from Prescott. The latest news is that the Mexicans were making from $6 to $30 per day.

"A miner, while prospecting near Prescott, struck a gulch, out of which he took $9.50 in a few hours. He refuses to reveal the whereabouts of his treasure.

"The search for the rich gold lode in the Black Hills, discovered by Roy Jay, some time previous to his murder by Indians, has proved fruitless.

"Mr. Genung, operating at Montgomery, has crushed, in his arastra, 2500 pounds of ore, and A. J. Shanks, who came here from the mine recently, says he saw $90 taken from the arastra.

"Work on the Sterling Mill is progressing favorably."

Washington Territory.

NEW BEACH MINES.

THE Portland *Oregonian* says: "Mr. J. A. Crawford, who returned a few days since from Gray's Harbor, Washington Territory, informs us that he found on the beach at Chehalis Point, several men mining for gold. They were sluicing the sand lying above the summer tides, and obtaining fine gold, which they saved by the use of quicksilver. He was not able to learn from them what pay they are making, but he believes, from appearances, that they are making better than the ordinary wages of the country. Mr. Crawford prospected along the beach at the foot of the hills for some distance, always obtaining 'the color,' and sometimes a prospect which would seem to justify working, if sluices were run by water from the mountain-streams. The miners who were at work were using sea-water, and, of course, labored under many and great disadvantages. He is of the opinion that ditches could be cut, at small cost, so as to supply sluices with water from some of the streams, and that then a considerable number of men might get remunerative pay. The gold is fine, but round and heavy, and is worth the highest rates for amalgam gold. The experiment suggested by him might be worth the trial."

Canada.

THE MADOC MINES.

THERE appears to be but little doing in the Madoc mines. The *Mercury* of July 31st says that the result of the second cleaning up at the Gillen Company's mill was nearly 7½ oz. of gold. "Although more than a week had elapsed since the first ingot was obtained, the above yield is estimated as equal to a week's actual work; the difference being accounted for by one of the stamps breaking down, and by some deficiency in the mill-dam impeding operations.

"We hear that owing to the promising aspect of affairs at the Gillen Company's property, it is contemplated to remove the Caldwell mill from its present site to that neighborhood; and also a rumor that the Toronto and Whitby Company's mill may be removed from Bannockburn to Marmora."

The Hell-Gate Obstructions.

WHILE people are expending admiration upon new plans and ingenious inventions for overcoming the channel difficulties, it is worth while to ask the practical question, What is being done? The public are aware that contractors have undertaken the work of removing the obstructions. What are they doing, and how does the work actually stand? The contractors are Messrs. Maillefert and Shelbourne, each acting independently according to his own ideas and methods, and on separate ground. Mr. Maillefert's plan he has patented long ago, and it is easily described and understood. It simply consists in depositing a quantity of powder on the surface of the rock to be removed, and then exploding it. There is no cumbrous apparatus used. A sounding pole, to ascertain the depth, a boat to contain the operators, and an electric battery are all the machinery employed. The explosion is effected by electricity, and it is the same thing whether the operators are stationed, near or far, they need never be in danger. This method of blasting, where there is no boring or drilling, but simply by exploding gunpowder on the surface, is not thought well of by many, yet more success has attended it so far than any other. Mr. Maillefert does not profess that his method is the best or cheapest, but he claims that it is the only practicable one in this passage of Hell-Gate, where the force of the current is such that no apparatus can be permanently fixed. What adds powerfully to the force of the explosion is that it takes place under some twenty-five or thirty feet of water, and the shock is so sudden that the water affords almost the same resistance as solid rock. As illustrating the effect of a superficial charge in blasting downward, it will be remembered that a few years ago a quantity of gunpowder exploded in a wagon, in Wilmington, N. C., making a hole in the ground nine feet deep. Mr. Maillefert is at present engaged on Way's Reef, which he is chipping away every day. He has already reduced the reef from five feet depth of water to fourteen feet. The other day he fired three charges of one hundred and twenty-five pounds of powder each; two produced considerable effect, the other not so much. Mr. Maillefert estimates the cost of clearing the channel at $8,000,000, and the time seven or eight years. General Newton has made two or three estimates, ranging from six to ten millions of dollars.

The other contractor, Mr. Shelbourne, is not idle. He is working on Frying-Pan. His drilling-machine is somewhat complicated and heavy, weighing altogether twenty-eight tons. The boat which he used in lowering it was not properly anchored, but drifted a good deal; hence his machine missed the precise spot intended. This new steam drill is simply intended to bore a hole in the rock to any depth; then a charge of nitro-glycerine is to be got down, and the rock blasted. This drilling-machine may be likened, in shape, to a sugar-loaf with the top cut off. The base is a heavy metal ring twenty-eight feet in diameter; the top is a similar ring forty-five inches in diameter. As the machine lies in the water at present, one edge of the base is tilted up considerably, leaning on the rock; the other edge rests on the bed of the river, and the slant line is nearly perpendicular. The side is only a skeleton, consisting of four wrought-iron bars connecting the two rings, each bar four inches in diameter. The drill-bar proper works up and down through a tube that ordinarily would be the axis of the whole apparatus, but which is hung in such a manner as always to maintain the perpendicular. This drill-bar alone weighs a quarter of a ton. It is tipped below with a steel bit. The perforation is effected, not by circular motion, as that of a gimlet, but solely by impact downward. The drill-bar is raised by steam, then falls and strikes the rock by its own momentum. The mechanism to produce this effect is ingenious, and the inventor has said that it worked well out of water; it now remains to be seen what the whole will do in the water.—*New-York Tribune.*

Steam-Engine Performance.

IN the ordinary mode of comparing the duty of steam-engines by determining the quantity of coal necessary to develop a given power, the efficiency of the boiler is not distinguished from the efficiency of the engine. Messrs. B. W. Farey and Bryan Donkin, of England, have recently made some interesting experiments with an apparatus designed to measure directly the heat carried away in the condenser. Measuring at the same time the work developed by the engine, by means of indicator diagrams, all the elements are ascertained, necessary for determining the efficiency of the engine independently of the boiler. The quantity of water passing through the condenser is measured by conducting it over a weir or notch. The temperature of the condensing-water on entering the condenser, and that of the mixture of injection-water and condensed steam leaving the condenser, is ascertained by ordinary thermometers; lastly, the work done in the cylinder is ascertained by indicator diagrams. Dividing the horse-power developed in the cylinder, expressed in thermal units, by the quantity of heat imparted to the injection water in thermal units, the quotient expresses nearly the efficiency of the steam. And since the efficiency of the steam in the same engine does not vary much for moderate variations of power, when the efficiency of the steam has once been ascertained, the measurement of the volume and temperature of the injection-water affords a new means of ascertaining the work done by the engine. Messrs. Farey and Donkin have therefore contrived photographic registering apparatus, by which the volume of flow and temperature of the injection-water are continuously recorded; the data so obtained being used either to determine the efficiency of the steam, or, if the efficiency of the steam is known, to determine approximately the power of the engine.

Corrugated Iron.

A COVERING material possessing compactness, lightness, and strength, with the further qualifications of being weather-proof, easily carried, and easily fitted, is very much required in a country like our own. Rapidity in the construction of buildings of all kinds is a great desideratum, now that our territories are becoming so extensively populated, and that with such great speed. Corrugated iron is a material that possesses many of the above noted qualifications, and when galvanized, or, more properly speaking, zincized, its durability is greatly increased. In engineering operations, it is always a ready material for the roofing of engine and store houses, and depots.

Fig. 2.

The use of corrugated sheet-iron in *wet* tunnel-works is most advantageous; the water from the leakings, which would otherwise drench and impede the men in the prosecution of their work, is, by the insertion of a temporary arch of corrugated iron, drained off to the sides, and thence to the invert. Baggage and freight cars can be not only roofed with this material, but their sides also may be constructed of it with much economy and neatness, as shown in the accompanying illustration, Fig 1. In Europe this application is very common. Railway buildings, depots, engine and store houses, roofed with this material, will always have a neat, trim appearance. We have noticed a recent application of this material by the American Corrugated Iron Company, of Springfield, Mass., which appears to possess many mechanical advantages. It is the general practice, in the formation of the floors, etc., of fire-proof buildings, and also of the arched roofing supporting the sidewalk over underground rooms, to turn brick arches over the intervening spaces between the cast or wrought iron girders. This forms a bearing surface, which is filled in with concrete or other material to a level with the top flange of the girders. This operation completes the flooring. Brick arches offer many disadvantages. A brick or two being displaced will endanger the arch. The buckling out of the supporting columns, even for an inch or so, will also jeopardize the arch. An iron arched plate does away with these difficulties. This can be made of superior strength, although very much lighter than brick-work. Where a brick arch averages 60 pounds to the foot, a corrugated iron one averages only 3 pounds. Another advantage is the facility of fitting corrugated iron arches, and their neat appearance when in position. Brick arches necessarily require to be dressed with plaster, whereas this operation is unnecessary in an iron arch. We give an illustration, as seen in Fig. 2, of this application of the material under discussion.

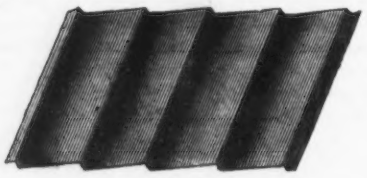


Fig. 3.

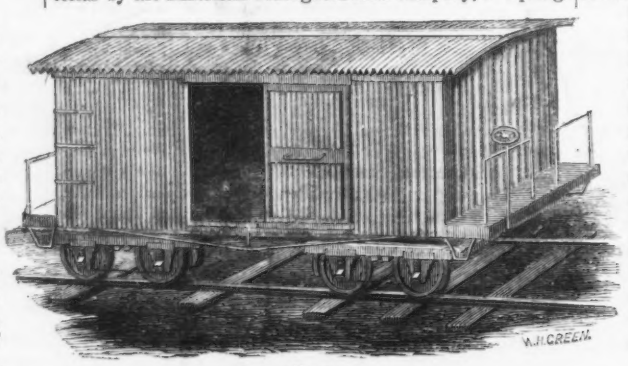


Fig. 1.

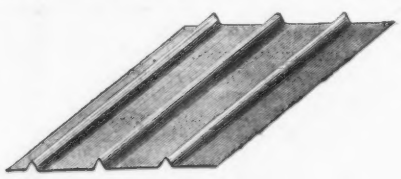


Fig. 4.

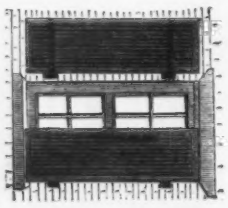


Fig. 5.

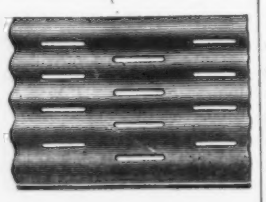


Fig. 6.

For building purposes, especially where a temporary structure is required to be erected, its application is excellent. The temporary building in which the Annual Fair of the American Institute will be held is to be of corrugated iron. It is a building of large dimensions, being upward of four hundred feet long. A timber frame, covered with sheet corrugated iron, of the pattern shown in Fig. 3, forms a strong building suitable for dwelling purposes. If required to be still more secure, the pattern shown in Fig. 4 can be used. This is intended to cover a wooden frame inside and outside, thus avoiding the expense of plaster for the internal walls. Where windows are inserted, their shutters can be made of the same material as the walls, thus adding security to neatness, as represented in Fig. 5. Where ventilation is desired, as in stabling, dock warehouses, etc., corrugated iron with slots, as shown in Fig. 6, will be found to answer the purpose advantageously. To avoid the objection of nails being used in securing the corrugated iron upon the roof, a simple arrangement, as shown in Fig. 7, can be adopted. It is known as Outcalt's elastic joint iron roofing. It would occupy too much space to recite the endless variety of purposes to which corrugated iron can be and is applied. Its remarkable lightness is, perhaps, its greatest recommendation. We have seen it used in the construction of life-boats, pontoons, buoys, and other maritime constructions. We would recommend its more general adoption for frame dwellings, and particularly for railway-cars.

Fig. 7.

A Public Telegraph in Buenos Ayres.

THE first public telegraph which has been constructed by the Government of Buenos Ayres was opened on May 4th. Cards were issued jointly by the President of the Argentine Republic, Don Domingo F. Sarmiento, and the Governor of Buenos Ayres, Don Emilio Castro. Many of the principal native and foreign residents availed themselves of the invitations. Two Morse instruments (by Siemens Bros.), placed in the drawing-room, worked direct with the main line, and from 2 P.M. to 4 P.M. about one hundred congratulatory dispatches were transmitted. The President made a speech, in which he said: "The time may not be distant when the telegraph will unite South-America to Europe." The telegraph passes westerly from Buenos Ayres for 100 kilometres on the Government railway, then northerly for 300 kilometres, crossing several large rivers to San Nicolas de los Arroyos and Rosario de Santa Fé, two ports on the Parana to which the Liverpool line of steamers can pass. The total length of the line is 405 kilometres of double conductors, being the greatest distance made in South-America by one administration. The President has recently contracted for the construction of 800 miles of telegraph, commencing at Rosario, to proceed northward. The tariff of the Government telegraph is, for a message transmitted under 100 miles, 1s. 8d.; from 100 to 200 miles, 3s. 4d.; and above 200 miles, 5s. The Congress of the nation was opened on May 5th, and, by the President's desire, his speech, consisting of 5020 words in Spanish, was telegraphed to Rosario, and published there the same afternoon.

Safety-Lamps.

MESSRS. W. H. HALL and J. COOKE, of Birmingham, say their improvements relate to the manufacture of safety-lamps for burning petroleum or such like oils, and consist principally in constructing the burner so that the flame will burn in the lamp brightly without additional glasses. The lamp they prefer is the "Stephenson" lamp, or "Geordy." The burner is made by first casting a shell for the bottom part, and this is made so that it can be screwed to any ordinary Stephenson lamp in place of the common burner screw. On the top part of this shell is placed a diaphragm, which contains, or to which is fastened, the wick-tube. The said diaphragm is raised in the centre (by preference) to allow space for the pinions or small wheels to be worked for raising or lowering the wick. Over this diaphragm and wick-tube is placed a cone, which has an opening at the top for the flame to protrude, and several holes at the bottom to feed the flame. The wick-tube is (by preference) flat, and reaches to the top of the dome. The parts of the burner are fastened together at the centre, and the pinions, with the spindle for raising the wick, are placed in their respective positions at the time. In constructing the lamp, they prefer to form the top of a cone-shape, with holes round the base; and inside these holes—that is, inside the cone—they place a smaller cone or tube, without a top, so that it shall break the draught when it is strong, but still give egress to the foul air from the lamp.—*Scientific Opinion.*

The Setting of Hydraulic Cements.

THE cause of the setting of hydraulic cements has been investigated by several chemists, who have in general agreed that it is owing to the formation of a double silicate of alumina and lime and the absorption of water. The question may be said to be set at rest by some researches of M. Frémy, who has shown that when an argillaceous limestone is calcined, at a dull red heat, a partial decomposition of the clay takes place; the silica and alumina, in fact, are separated, and are made free to combine with the lime when the cement is mixed. This is not really novel information; but the truth is shown more clearly by the experiments of M. Frémy. The part which the free lime plays is also made clear. If this be dissolved out by weak acid, or water, or syrup, the residue of silica and alumina will not set under water, but the cement may be reproduced by the subsequent addition of some lime.

THE ENGINEERING AND MINING JOURNAL.

CONTENTS FOR THIS WEEK.

[*Illustrated Articles are marked with an asterisk.**]

*The Bombay Water-Works,	81	MINING SUMMARY,	86
A New System of Assay Weights for Gold and Silver Ores,	82	The Hell-Gate Obstructions,	88
Steamboats on the Erie Canal,	82	Steam Engine Performance,	88
Colorado from an Engineering Point of View,	83	*Corrugated Iron,	88
Metals Absorb Gases,	83	A Public Telegraph in Buenos Ayres,	88
"Heat Unit—New Method of Determining,"	83	Safety Lamps,	88
The Gulf Stream,	84	The Setting of Hydraulic Cements,	88
White Pine,	84	EDITORIALS:	
Water as Fuel,	84	The Influence of an Association of Civil Engineers,	89
Submarine Railways,	85	The Great Solar Eclipse,	89
Exploring Expeditions in the North Polar Regions,	85	Balances of Great Precision,	89
A New Hot-Spring,	85	The East River Bridge Engineer,	89
The Hudson and East River Canal,	85	Reconstruction a Necessity,	89
QUERIES,	85	MARKET REVIEW,	90
		Advertisements,	91

PUBLISHERS' ANNOUNCEMENT.

THE ENGINEERING AND MINING JOURNAL *is projected in the intent of furthering the best interests of the Engineering and Mining public, by giving wide circulation to original special contributions from the pens of the ablest men in the professions. The careful illustration of new machinery and engineering structures, together with a summary of mining news and market reports, will form a prominent feature of the publication.*

SUBSCRIPTION.—*The terms are as follows: One copy,* **$5** *per annum in advance; three copies,* **$13.50**; *five or more copies,* **$4** *each.*

ADVERTISEMENTS.—*The rates are as follows: Inside pages,* **25** *cents per line each insertion; the outside or last page,* **40** *cents per line. Payment required in advance.*

NEWS-DEALERS *will be supplied through the agency of the* AMERICAN NEWS COMPANY, 121 *Nassau Street, New-York City.*

COMMUNICATIONS *of all kinds should be addressed to the Publishers. The safest method of transmitting moneys is by checks, or Post-office orders, made payable to their order.*

Correspondence and general communications of a character suited to the objects of THE ENGINEERING AND MINING JOURNAL *will always be welcome.*

The postage on THE ENGINEERING AND MINING JOURNAL *is twelve cents a year, payable quarterly, in advance, at the office where received.*

JOHN F. RICH *is our Agent for New-England. Office,* 13 *Boylston Place, Boston.*

GEO. E. CUMMINGS *is our Agent at Philadelphia. Office,* 154 *South Fourth Street, Room* 5.

WESTERN & COMPANY,
Publishers and Proprietors,
37 PARK ROW,
P. O. Box 5969. New-York City.

The Influence of an Association of Civil Engineers.

AN association of civil engineers may be simply a learned society, for the discussion of technical questions, or it may combine the object of a learned society with that of a club for business or social intercourse. If a company of civil engineers meet together at stated times for scientific discussion, and if the professional men comprising that company have no other occasion of meeting together but for this purpose, it follows that men possessing a similarity of sentiment will naturally add discussion on social and business subjects, to that of scientific and engineering ones. This tends to the formation of an association which partakes at least to some extent of the character of a club, with a place of meeting in a convenient position, a library, reading-room, and lecture-hall. Such an institution is in active existence in London—namely, the Institute of Civil Engineers. It may be interesting to consider the abuses and uses of this institution, as a means of information for the engineers of this country. The English Institute was founded by the great Telford, purely for the purposes of a learned society, to be devoted exclusively to the interests of civil engineers. But the Institution has undergone numerous modifications. It was once an humble society, its various members coming together for scientific intercourse. It has since grown to be a wealthy society of extended influence, and now represents only to a very limited extent the intentions of its founder. It is the nucleus of the English civil engineering interest, its very location being in the centre of the civil engineers' quarters in London, and contiguous to the Parliament Houses, where all legislative business, as to the passage of railway-bills, etc., is transacted. Also near by are situated the offices of the leading civil engineers and contractors. The whole forms a vast combination, so that a project can be financed, engineered, and contracted for, on the spot. The Institution is a general reference for all professional matters. It is governed by a council, either of eminent civil engineers, or engineers having a large practice. These councilmen, working in combination, form a monopoly which by many is considered oppressive and detrimental. Even contractors are by regulation associated with the council. Papers on engineering and scientific topics are read and discussed at weekly meetings, many of them papers of much merit. At the termination of the session, prizes, medals, etc., are awarded to the authors of papers read during the session, according to individual merit, or maybe in view of the importance of the subjects treated. But we are informed, on good authority, that these meetings for the reading and discussion of papers are devoted rather to social entertainment than to hard, earnest professional work, so that the Institution partakes rather of the character of a club. To be an active member of the Institute of Civil Engineers, is to have a standing and respectability as an engineer. A valuable library and reading-room is at the disposal of the members of the Institution. But the all-important object appears to be a business one. Without wishing to speak disrespectfully, we cannot say other than this, that it is simply a trades combination. Many of the English civil engineers of large practice are more eminent for their administrative than their engineering ability. This statement, although apparently incongruous, is nevertheless true, and that naturally so.

The combination of scientific knowledge with executive and business capacity is not common. But the public, particularly the British public, lose sight of the departmental man in the chief man. As a consequence, when once an engineer has gained a certain prestige, either on account of the formation of a successful company or the carrying out of a project, he is exalted not only to his legitimate position of a first-class business man, but also to that of a first-class engineer. With the English public, *name* is every thing, and independent judgment nothing. Such a man will undertake an amount of work that would appall a conscientious American engineer. His time is wholly occupied with what may be termed the business of his profession. To many of his undertakings he has not given any consideration further than to the business element connected with them. Apart from his affixing his signature to the drawings prepared in his establishment, he knows literally nothing relating thereto, and may be incapable even of comprehending them were he to attempt to do so. The consequence of this is, there is a want of individuality of idea in the work. The truly sound engineering subordinate, having no further recompense than the weekly wages of a draughtsman, is careless as to the result, while his associates are addicted to tables, or "the rule of thumbs." It is true, there is a managing man, who is generally a practical engineer, often an eminently scientific one, but he suffers from the same inconvenience as his master. His hands are so occupied that, with the exception of an occasional hasty direction here and there, he has but little time for a careful consideration of each individual plan. These subordinate managing engineers are as well known as their various styles of engineering, and any purely engineering question is discussed with them in preference to their chief. An examination of the engineer, either before shareholders or a legislative committee, is generally "got through" by an amount of prompting and pencilling that renders the result far from satisfactory. This is tolerated only on the ground that he is an engineer of immense practice, and a member of the Institute—a fact very consoling to the shareholder. Our readers will wonder at the above apparent diversion from the subject in hand, but this brief sketch of some of the characteristics of London engineers may be instructive. It will be seen that a combination of such men would have a very detrimental influence upon engineering and commercial interests with us. This is, we believe, one of the mischievous results of the introduction of business into a learned society. As a result, another opposing institution has sprung up in London. Through this means, it is hoped, there will soon be a better distribution of professional practice. Here, we require an institution where the civil engineering interest can have a home; we require some more efficient means of communication than we have at present for business as well as scientific purposes. But the scientific object should be definitely separated from the business one. The American Association of Civil Engineers we may proudly term a learned society, though it does not, as yet, come fully up to the mark as regards the requisitions just noted.

The Great Solar Eclipse.

AT the moment this number of THE ENGINEERING AND MINING JOURNAL will leave the press, an astronomical event will take place which has been expected for many years, and for which astronomers, photographers, and physicists have long been preparing. This total eclipse will be the most important one of this century, as the sun, from certain places of observation upon the continent, will be totally obscured. In order to understand the difference in various eclipses of the sun, it must be remembered that, notwithstanding the fact that the sun's diameter is some four hundred times greater than that of the moon, they appear to be about the same size. This is occasioned by the sun's being about four hundred times further away from us than is the moon, in technical phrase, they are both seen under an angle of half a degree. As, however, the distance of the sun to us is not always the same, it will sometimes appear slightly larger, and sometimes slightly smaller. This is also the case with the moon. If, now, an eclipse of the sun takes place when it is nearer, and the moon farther off than usual, the sun will appear slightly larger than half a degree, and the moon a little smaller. Consequently, if the moon arrives at that moment exactly in front of the sun, we will see the edge of the sun all around it, in the form of a ring. The eclipse is, therefore, called, under such circumstances, annular. As, however, the sun does not entirely disappear, it is not total. But if the sun is at its farthest distance from the earth, and the moon at its nearest, the latter body appears larger than half a degree, and the former smaller. Under such conditions, when the moon comes just in front of the sun, it will obscure it entirely, and, for a period of one or two minutes, absolutely nothing of the sun will be visible. The eclipse is then called total. Such an eclipse occurs on August 7th, when seen from certain points of observation. It will, however, be total only in those places situated on the imaginary line passing through the centre of the sun and moon. These places are Lincoln and Burlington, Iowa, Springfield, Ill., Louisville, Ky., Knoxville, Tenn., Raleigh and Newbern, N. C., and at a distance of some one thousand miles north and south of this line the eclipse will be only partial.

The special interest which attaches to this eclipse, however, is, that, with the modern means at our command, we may hope to make some important discoveries. These means are, firstly, telescopes, with which we may make photographic records, not only of the appearance of the eclipse at different stages of its progress, but of effects which would otherwise be imperceptible to the eye; and, secondly, spectroscopes, with which we may ascertain the chemical nature of any phenomena which may present themselves. The atmosphere of the sun, which we now know to extend to a height at least two thousand times greater than that of our atmosphere, is always invisible to us, because of the glare of our atmosphere when illuminated by sunlight. The only means by which this illumination of our atmosphere may be removed is by the agency of a body far outside of it, and throwing a shadow over an extent of several hundred square miles. It fortunately happens that there is such a body. The moon, during a total eclipse, throws such a shadow on the earth, and lessens the illumination of our atmosphere to such a degree, that the luminous solar atmosphere becomes visible, and the spectroscope has taught us that the sun's atmosphere is totally unlike ours, containing bodies in the state of vapor which, on our earth, are solid. Among the most prominent of these constituents are sodium vapor and iron vapor. It is obvious from this that the temperature of the sun must be very high, and the old theory of Herschel, which has unfortunately been repeated over and over again in our astronomical school-books, and is to the effect that the sun is a dark, cold body, surrounded by a luminous, phosphorescent atmosphere, is exploded. We now know that the sun is a hot, incandescent, molten mass, its temperature being so high that we can with difficulty form a conception of it.

Balances of Great Precision.

WE reproduced in our last number a short article under the above head, from the *Chemical News*, with the intention, afterward, of making some comments upon it. The balance on two columns is not quite new, nor is it an improvement, from the fact that when the two agate supports of the central knife-edges are attached to two separate columns, they cannot be kept in one plane as perfectly as when they form the top of a single bifurcated column, between which bifurcation the balance-beam is situated. For this reason the plan has not been adopted by the best balance-makers. In regard to the results mentioned as having been obtained by means of balances made after this system, it is stated that a balance bearing 35 kilos. in each scale was sensitive with that load for 5 milligrms. As this is one fourteen millionth part of the whole charge, it is surpassed by a balance which recently came in possession of Bowdoin College, Maine. This balance, with a charge of 10 kilogrs. in each scale, is sensitive for one tenth of a milligrm., or the one twenty millionth part of the whole charge. It is mentioned that the University of Upsala, in Sweden, has two balances, each carrying 1 kilo. in each pan, and sensitive for 1½ milligrm. We are, here in New-York, far ahead of that. Balances can be bought here which, when charged with 1 kilo. in each scale, are sensitive for one tenth of a milligrm. These balances are, therefore, fifteen times more sensitive than the Swedish ones. We have in our own office a balance which, when carrying 100 grammes in each scale, is sensitive to one tenth of a milligrm., and, of course, much more sensitive when charged with a less weight. In any event, they surpass the statements made by our English and French contemporaries. We will only add that the common assay balances now in use in the United States assay office in New-York City show a difference in load of less than the one hundredth part of a milligrm.

The East River Bridge Engineer.

WITH the death of John A. Roebling, there came naturally enough numerous inquiries on the part of the public as to who would succeed him as Chief Engineer of the East River Suspension-Bridge enterprise. To span the Niagara with a cable bridge was, as every one at all familiar with engineering operations will admit, a bold undertaking. Full well then are we justified in saying that the work of binding together the cities of New-York and Brooklyn by a similar means is a herculean task. But what is the answer to the interrogation of the public? Has it been thought expedient, or necessary, rather—in view of the dicta of a distinguished University President to the effect that we have no engineering skill in this country—to send abroad in order to obtain the constructive talent requisite for carrying on to completion the gigantic work? The Board of Directors of the East River Bridge Company have unanimously resolved to elect Mr. Washington A. Roebling successor to his father as chief engineer. Therein have we a reply to our interrogations. We make no doubt the appointment is an exceedingly judicious one. Mr. Roebling has had, in addition to the most complete theoretical training in the principles of his profession, a very large practical experience with his father in the building of suspension-bridges. There need be no question but that success will attend him in the prosecution of the work. We shall watch with interest the progress of the work, as being one in the list of gigantic engineering enterprises now going on, and, moreover, as being essentially American in the plan and method of its construction.

Reconstruction a Necessity.

A FEW days ago another railway accident was chronicled, with its horrible catalogue of killed and wounded. But how did the accident occur? ANSWER—*a train fell through a trestle-bridge!* The scene of the disaster was Buck Creek, near Clarksville, on the Memphis and Louisville Railroad.

MARKET REVIEW.

The Coal Trade.

NEW-YORK, August 4th, 1869.

As we predicted would be the case in our last issue, the high prices asked for coal have not been sustained. A break occurred in the market on Tuesday last, and after a decline of one dollar per ton, the market is left weak and feverish, with large quantities of coal offering. On an inflated market coal is spirited away, as it were, and none is to be had for love or money; but as soon as a weakness occurs, it as suddenly appears in the market in large quantities, and one might almost imagine it came by telegraph, so noiselessly and rapidly is the thing accomplished. On Saturday and Monday last coal was very scarce, but for the past three days it has been hawked about the market at a dollar or two less per ton, and the sellers look as though they would be happy to go "half-dollar" better than that, so little confidence have they in the strength of the market.

LEHIGH COALS.

The regular monthly meeting of Lehigh dealers was held on Tuesday last, and the following scale of prices was adopted for this month:

	At Mauch Chunk.	*At New-York.*
Furnace Lump,	$4 50	$8 25
Lump,	5 00	8 50
Steamer,	5 00	8 35
Broken,	5 00	8 35
Egg,	5 00	8 35
Stove,	5 00	8 50
Chestnut,	4 50	8 00

These prices are supposed to hold good during August, unless some unforeseen events occur to require a change. The dealers also passed resolutions limiting credits on coal—a point upon which we shall have more to say hereafter.

SCHUYLKILL COALS.

There being no regular organization of Schuylkill dealers here, the coal is mostly shipped by operators to the market "on sale," and such prices taken as may be ruling at the time of their arrival. Other coals generally have the preference in this market, excepting some old and well-tried kinds, such as Diamond Vein, Locust Dale, Locust Mountain, Duncan Red Ash, and others of their stripe. It is generally understood that New-York has been saddled with Philadelphia's surplus of Schuylkill coal, and that the coal, being mined to a great extent by small operators, is not well prepared. The best Schuylkill coals were offered to-day for from $8 to $8.50, or about $1 below last week's prices.

Wilkesbarre, McNeal, and Wyoming coals are offered at Lehigh prices, with, perhaps, a slight concession of say 10 or 15 cents per ton.

COMPANY COALS.

The Delaware, Lackawanna, and Western Company and Delaware and Hudson Company are yet idle, with no signs of a compromise with their men. No price can be named for their coal in this market. The Pennsylvania Company have no quotations, except to those who contract regularly for a certain quantity monthly. The prices we quoted last week of this company still hold good.

GAS COALS.

Provincial or Nova Scotia coals are very dull, and but few cargoes are arriving. There is more doing in American. The Despard Coal Company, who supply a superior quality, are mining some 2000 tons per week, and have already shipped some 60,000 tons this season. This coal has been adopted by the Manhattan Gas-Light Company, which has induced other large companies to try it, and, in many cases, it gives satisfaction equal to the best English coals. Another point in its favor is that it is sold at a much lower figure. To Messrs. Parmele Brothers, of this city, is due the credit of having placed the Despard coal in so favorable position in this market. It is quoted by them at from $8.25 to $8.50 per ton.

FOREIGN COALS.

There is some demand for House Cannel, and we note sales of 2000 tons during the past week on private terms.

FREIGHTS.

Vessels are in good supply, and the decline in prices has extended to freights and boats, which are to be had at a concession of 15 or 20 cents to Eastern ports.

PRICES.

At best, are nominal. We are of the opinion that the break in prices may cause a general disarrangement in trade, which may either lessen or enhance values. There is one thing very apparent now—that is, with the recent advances in freights and tolls by the transportation companies, a lower figure than at present asked for coal will not pay the operator, and that, if the price continues to recede, in consequence of the large quantity arriving weekly, that unless the rates of freight are reduced in the same ratio, another suspension—this time by the *operator*—will take place. This will result, if both the operators and miners closely adhere to the terms of the basis. The probability is that orders given during the coming week for coal will be at prices as favorable as can be obtained this fall.

The following table exhibits the quantity of Coal passing over the following routes of transportation for the week ending July 31st, 1869:

COMPANIES.	1868. WEEK.	1868. TOTAL.	1869. WEEK.	1869. TOTAL.
Phila. & Read. R. R.	5,878	1,683,643	115,131	1,864,494
Schuylkill Canal,	897	480,454	38,131	352,519
Lehigh Valley R. R.	32,912	1,348,203	67,793	1,254,134
Lehigh & Sus. R. R.	6,219	181,828	23,676	448,408
Lehigh Canal,	2,079	393,949	41,138	314,863
Scranton North,	8,474	297,369		205,857
" South,	23,874	623,857		587,631
Penn. Coal Co., rail,	20,349	504,906	10,481	545,543
" " " canal,	824	14,035		9,041
Del. & Hudson Rail,			400	99,745
" " " canal, N.	44,298	765,300	19,200	613,162
" " " " S			085	51,174
Shamokin,	8,976	270,076		187,704
Trevorton,	782	11,689	1,358	11,091
Short Mountain,	3,011	56,990		57,260
Lykens Val. Co.	2,270	48,121	2,483	37,716
Hunt'g'n & B'd Top,	5,150	135,339	8,556	204,324
Wyoming South,		102,536		83,955
" North,		12,599		2,552
Williamstown, Col'y	4,050	95,061	6,815	103,439
Total,	170,043	7,024,965	335,247	7,030,613
1869,			170,043	7,024,965
Decrease week,			165,204	
Increase year,				5,648

Lehigh Canal Coal Trade.

Shipped for the Week Ending July 31, 1869.

WHERE FROM.	WEEK. Tons. Cwt	TOTAL. Tons. Cwt.
Total M. Chunk Region,	11,172 01	90,400 13
" B. Meadow "	7,480 19	48,934 09
" Mahanoy "	362 16	1,433 13
" Hazleton "	11,800 19	82,373 06
" Upper Lehigh "	598 15	3,494 17
" Wyoming "	9,723 06	88,226 14
Grand Total,	41,138 16	314,863 12
Corresponding week last year,	2,079 13	393,949 07
Increase,	39,059 03	
Decrease,		79,085 15

Report of Coal Transported over Lehigh Valley Railroad

For the week ending July 31, 1869, and previously this season, compared with the same time last year:

WHERE SHIPPED FROM.	WEEK. Tons. Cwt	PREVIOUSLY Tons. Cwt.	TOTAL. Tons. Cwt.
Total Mahanoy,	16,937 03	197,605 17	214,543 00
" B. Meadow,	14,012 16	215,843 07	229,856 03
" M. Chunk,		150 10	150 10
" Lehigh,	28 13	8,119 02	8,147 15
" Hazelton,	27,568 09	572,492 01	600,060 10
" Wyoming,	10,260 15	229,430 05	239,691 00
Total,	68,807 16	1,223,641 02	1,292,448 18
To L. & S. R. R., at P'n Hav. for rail,		4,174 00	4,174 00
Do. for canal,	11,603 03	74,573 07	86,176 10
At Mauch Chunk for canal,	7,753 15	44,429 14	52,183 09
Total Anthracite,	88,164 14	1,346,818 03	1,434,982 17
Susquehanna Region Bit. Coal (Fall Creek),		552 03	552 03
Tl. by rail & canal,	88,164 14	1,347,370 06	1,435,535 00
Same time last y'r,	34,970 02	1,415,770 18	1,450,741 00
Increase,	53,194 12		
Decrease,		68,400 12	15,206 00
Forw'd east from M. C'k by rail,	67,793 17	1,186,340 12	1,254,134 09
Same time last y'r,	32,912 07	1,315,291 08	1,348,203 15
Increase,	34,881 10		
Decrease,		128,950 16	94,069 06

RECAPITULATION:

Forw'd east from M. C'k by rail,	67,793 17	1,186,340 12	1,254,134 09
Del. at M. Chunk,	17 00	637 09	654 09
Del. on line of r'd above M. Chunk,	90 06	5,450 04	5,540 04
Del. ab. M. C. for use of L.V.R.R.,	784 00	26,457 18	27,241 18
To N. C. R. R., at Mt. Carmel,		2,516 09	2,516 09
To L. & S. R. R., at P'n Hav., for r'l.		4,174 00	4,174 00
Do. for canal,	11,603 03	74,573 07	86,176 10
Do. Packerton for rail,	122 09	2,790 13	2,913 12
At Mauch Chunk for canal,	7,753 15	44,429 14	52,183 09
Total,	88,164 14	1,347,370 06	1,435,535 00

Lehigh and Susquehanna Railroad.

Report of Coal Shipped South for the Week ending July 31, 1869.

WHERE FROM. WYOMING REGION.	WEEK. Tons. Cwt	TOTAL. Tons. Cwt.
Total M. Chunk Region,	5,535 03	83,579 19
" Hazelton "	11,594 09	83,854 19
" Upper Lehigh "	4,011 03	69,723 19
" Wyoming "	24,364 11	382,443 19
Grand Total,	45,505 06	619,602 16
Corresponding week last year,	10,892 09	424,008 05
Increase,	34,612 17	195,594 11
Decrease,		
Forwarded South from Mauch Chunk,	23,014 10	410,978 09
Delivered on line of L. & S. R., above Mauch Chunk,	661 08	18,590 07
Delivered to Lack. & Bloom. R. R., at Plymouth Bridge,		13,688 06
Delivered to L. V. R. R. Co., at Sugar Notch,		5,151 03
Delivered at Coal Port, for Shipment by Canal,	21,829 08	171,194 11
Total,	45,505 06	619,602 16

Schuylkill Coal Trade.

Report of coal transported over the Schuylkill Canal for the week ending Thursday, July 29th, 1869.

	Tons. Cwt.
From Port Carbon,	14,133 00
" Pottsville,	2,569 00
" Schuylkill Haven,	20,201 10
" Port Clinton,	1,227 00
Total for week,	38,130 10
Previously this year,	314,388 17
Total,	352,519 07
To same time last year,	480,453 19

Report of coal transported by the Philadelphia and Reading Railroad during the week ending Thursday, July 29th, 1869.

	Tons. Cwt.
From St. Clair,	40,411 05
" Port Carbon,	10,029 17
" Pottsville,	4,453 01
" Schuylkill Haven,	34,877 16
" Auburn,	4,123 17
" Port Clinton,	18,678 06
" E. P. R. R.,	351 04
" Harrisburg and Dauphin,	12,989 03
Total paying freight,	125,914 09
Coal for Company's use,	2,567 07
Total for week,	128,481 16
Previously this year,	2,049,934 00
Total,	2,178,415 16
To same time last year,	1,927,804 00

The Cumberland Coal Trade.

COAL TRADE BY CANAL.—The following shipments by the Chesapeake and Ohio Canal were made for the week ending Saturday, July 24th:

	Tons.
George's Creek Co.,	448.01
American Co.,	4,497.16
Central Co.,	3,440.17
Midlothian Co.,	753.04
Hamp. and Balt. Co.,	1,506.00
Consolidation Co.,	2,977.15
Borden Co.,	2,280.17
C. C. & I. Co.,	1,593.16
James Boyce,	224.00
Total for week,	17,722.06

Statement of coal shipments over the Baltimore and Ohio Railroad for the week ending July 24th, 1869, were as follows:

	Tons.
Despard Gas Coal Co.,	1,448.00
For the year,	51,552.00

The Cumberland Coal Trade.—Continued.

From Cumberland and Pa. R. R. via Cumberland.

	Tons.
Consolidation Co.,	2,317.62
Borden Co.,	1,692.05
Hampshire & Balt. Co.,	749.04
Midlothian Co.,	1,172.19
Alleghany Co.,	67.15
From Eckhart R. R.	
C. C. and I. Co.,	3,468.16
From George's Creek via Piedmont.	
George's C. C. & I. Company,	2,645.17
Central "	1,895.02
Atlantic "	1,755.01
Franklin "	2,059.12
Piedmont "	2,239.07
Swanton "	1,126.14
Potomac "	1,292.04
Hampshire "	2,622.04
Barton "	354.18
American "	2,214.19
Total,	29,121.09

Prices of Coal by the Cargo.

[CORRECTED WEEKLY.]

	AT NEW-YORK, Aug. 5th. R. A.	W. A.	AT PHILADELPHIA, Aug. 5th. R. A.	W. A.
SCHUYLKILL.				
Lump,	$....	$8 25	7 50	7 25
Steamer,	....	8 00	7 50	7 25
Broken,	....	8 00	7 50	7 25
Egg,	....	8 00	7 50	7 25
Stove,	....	8 50	7 50	7 25
Chestnut,	....	7 50	6 50	6 25
Pea,	....	....	....	....
LEHIGH.				
Lump,	8 50	....	7 75	....
Steamer,	8 35	....	7 75	....
Broken,	8 35	....	7 75	....
Egg,	8 35	....	7 75	....
Stove,	8 35	....	8 00	....
Chestnut,	8 90	....	7 00	....
Pea,	....	....	5 25	....
SPECIAL COALS.*				
Diamond Vein,	R. A.	8 50	....	....
New-England,	"	....	....	....
Locust Dale,	W. A.	8 25	....	....
Honey Brook, Le'h	"	8 35	....	....
Harleigh,	"	8 35	....	....
Spring Mount'n	"	8 35	....	....
Sugar Creek,	"	8 35	....	....
Sugar Loaf,	"	8 35	....	....
Fulton,	"	8 35	....	....
Stout,	"	8 35	....	....
Old Comp'y's,	"	8 35	....	....
Cross Creek,	"	8 35	....	....
Chauncey,	"	....	....	....
Girardville,	"	....	....	....
McMichael,	"	....	....	....
Duncan,	"	....	8 00	....
Shamokin,	"	7 00	7 50	....
Lykens Valley,	"	....	8 00	....
Broad Top,	"	....	5 25	....
Hill & Harris,	"	....	7 50	....
Henry Clay,	"	....	7 75	....
Powelton,	"	....	7 50	....
Burnside,	" R. A.	....	8 00	....

[* Dealers in these coals may be found in our advertising columns.]

Kittaning Coal Co.'s Phœnix Vein, f. o. b. $5 50
Lemon " " " 5 25

Company Coals.

	L.	Str.	Gra.	Eg.	Sto.	Cst.
Scranton at E. Port,	...	...	...	...	...	...
Pittston at Newb'g,	8 60	8 60	8 60	8 60	8 80	8 20
Lacka'na at Rond't,	8 30	8 20	8 30	8 50	8 90	8 00
Wilk'b're at Hob'kn,	8 50	8 35	8 35	8 35	8 35	8 00

For freights to different points, see "Freights."

Foreign and Provincial Freights.

August, 1869.

Foreign.

New-Castle and Ports on Tyne, ... £15@£18 keel.
Liverpool, ... 15s. 17s. ton.

TO NEW-YORK.

Provincial.

Sydney, ... $3 25
Lingan, ... 3 25
Cow Bay, ... 3 25
Port Caledonia, ... 3 25
Little Glace Bay, ... 3 25

TO BOSTON.

Sydney, ... $2 75
Lingan, ... 2 75
Cow Bay, ... 2 75
Port Caledonia, ... 3 00
Little Glace Bay, ... 2 75

Prices at Baltimore, August, 1869.

Wholesale Prices to Trade.

Wilkesbarre, by cargo or car load, ... $7 25
Pittston and Plymouth, ... $7 00 7 25
Shamokin R., or W. Ash, ... 7 25 7 50
Lykens Valley, R. A., ... 6 75 7 00
Trevorton, R. A., ... 6 50 6 75
By retail, per ton of 2240 lbs. delivered, ... 8 50 9 00
Georges Creek & Cumberland f. o. b. at Locust Point for shipping, ... 5 00
West Fairmount Gas, f. o. b., ... 6 50

Prices at Georgetown, D. C., & Alexandria, Va.

August, 1869.

George's Creek & Cumberland f. o. b. for shipping, ... $4 75

Prices at Havre de Grace, Md.

August, 1869.

Wilkesb're & other White Ash for cargoes, ... $7 25
Lykens Valley, ... 7 25
Shamokin R. or W. Ash, ... 7 00 7 50
Trevorton and Zerba Valley, ... 6 75 7 00

Prices for Coal at Mauch Chunk.

	L.	Str.	Gra.	Eg.	Sto.	Cst.
Lehigh,	$5 00	$5 00	$5 00	$5 00	$5 00	$4 50
Wilkesbarre,	5 00	5 00	5 00	5 00	5 00	4 50

Freight to Elizabethport, $3.17; to New-York, $2.35.

Prices of Foreign Coals.

August, 1869.

Duty, $1.25 per ton.

Corrected weekly by PARMELEE BROS., 32 Pine-street, New-York.

Liverpool Gas Caking,	$ 9 50	
" Cannel,	14 00	
" House "	18 00	19 00
" " Orrel,	16 00	18 00

Per ton 2240 lbs., Ex. Ship.

PRICES FROM YARD.

Liverpool House Orrel, screened,	$16 00	$18 00
" " Cannel, "	18 00	20 00

Per ton 2000 lbs., delivered.

Prices of Gas Coals.

August, 1869.

PROVINCIAL.

Duty, $1.25.	Coarse. Gold.	Slack. Gold.
Block House,	$1 75 @$	75
Gowrie,	1 75	75
Lingan,	1 75	75
Sydney,	2 13½	71½
Pictou,	2 13½	1 18½
Little Glace Bay,	1 50	1 00
Caledonia,	1 50	75

AMERICAN.

	Coarse. Currency.	Slack. Currency.
Westmoreland Co.,	— —	
Despard Coal Co.,	$8 50	8 00
Penn.,	—	—
Newburg Orrel Gas,	—	—
West Fairmount Gas Coal,		8 00

AT PHILADELPHIA.

Powelton, ... 7 00

Freights.

August, 1869.

To Eastern Ports.	From Philadel'a.	From E. Port and Port Johnston.	From Newburg.	From Rondout.
Stamford,	$2 50	$1 00	$1 25	$1 25
Norwalk,	2 50	1 00	1 25	....
Bridgeport,	2 50	1 15	1 25	1 25
New-Haven,	2 50	1 00	1 25	1 25
Hartford,	2 50	1 10	....	1 65
New-London,	2 50	1 15	1 35	1 35
Norwich (and tow),	2 50	1 25	1 45	1 45
Mystic,	2 50	....	1 40	....
Stonington,	2 50	....	1 40	1 35
Sag Harbor,	2 50	....	1 40	....
Bristol,	2 50	....	1 55	1 60
Newport,	2 50	1 40	1 55	1 60
Fall River,	2 50	1 40	1 55	1 60
Providence,	2 50	1 40	1 60	1 60
Dighton,	....	....	1 60	....
Warren,	....	....	1 60	....
Pawtucket,	2 50	....	1 75	1 75
New-Bedford,	2 50	1 40	....	1 75
East Cambridge,	2 80	....	2 00	....
Salem,	2 80	1 75	1 85	1 75
Newburyport,	3 00	2 00	1 95	1 80
Portsmouth,	3 50	1 75	1 90	1 80
Rockport,	....	....	1 90	....
Saco,	2 75	1 75	1 90	1 75
Portland,	2 75	1 75	1 80	....
Bangor,	2 75	....	1 80	1 80
Bath,	2 75	....	2 00	....
Middletown,	....	....	....	....
Amesbury,	2 70	....	....	....
Boston,	2 75	....	....	....
Cambridgeport,	2 80	....	....	....
Taunton,	2 50	....	....	....
Derby,	2 00	1 25	....	....
New-York,	1 65	55	....	....
Hackensack,	1 75	..	....	....
Jersey City,	1 65	35	....	....
To River Ports.				
Troy,	2 35	95	60	65
Albany,	2 30	90	55	50
Coeyman's,	1 90	....	55	50
Stuyvesant,	1 90	....	50	45
Coxsackie,	2 15	....	45	45
Hudson,	....	1 00	40	50
Catskill,	....	....	40	35
Poughkeepsie,	1 90	75	30	25
Fishkill,	1 95	....	20	30
Cold Spring,	1 90	70	30	50
Haverstraw,	....	50	45	55
Nyack,	1 85	50	55	50
Sing Sing,	1 80	....	60	50
Yonkers,	....	40	60	55
New-York,	....	50	70	
Sangerties,	1 75	....	35	30
Rhinebeck,	1 85	....	30	35
Rondout,	1 85	60	30	25
Tarrytown,	1 90	80	60	....
West Point,	1 90	75	30	50

Rates of Transportation to Tide Water.

[BY RAILROAD.]

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven, ... $2 50

From Port Carbon, 8 cents per ton more.

TO ELIZABETHPORT.

L. V. Railroad from Mauch Chunk to Easton, ... $1 15
C. R. R., N. J., Easton to Elizabethport, ... 1 81
$2 96
Shipping Expenses at Elizabethport, ... 25
Total, ... $3 21

TO PORT JOHNSON.

L. V. R. R. $1 15
C. R. R. of N. J. 1 80
Shipping Expenses, ... 25
Total, ... $3 20

TO HOBOKEN.

L. V. R. R. $1 15
Morris & Essex R. R. 1 63
Shipping Expenses, ... 25
Total, ... $3 03

Metals.

IRON.—Duty: Bars, 1 to 1½ cents ℔ lb; Railroad, 70 cents ℔ 100 lbs.; Boiler and Plate, 1½ cents ℔ lb; Sheet, Band, Hoop, and Scroll, 1½ to 1½ cents ℔ lb; Pig, $9 ℔ ton; Polished Sheet, 3 cents ℔ lb.

	Store Prices.
Pig, Scotch, No. 1, ℔ ton,	38 —@42 —
Pig, American, No. 1,	42 — — —
Pig, American, No. 2,	38 — 39 —
Pig, American, Forge,	36 — — —
Bar, Refined, English and American,	85 — 90 —
Bar, Swedes, assorted sizes (gold),	82 50 87 50
Bar, Swedes, ord'y sizes,	less 5 ℔ ct., — — 140 —
Bar, Refined,	less 5 ℔ ct., 90 — 92 50
Bar, Common,	less 5 ℔ ct., 85 — 87 50
Scroll,	less 5 ℔ ct., 120 — 150 —
Ovals and Half-round,	less 5 ℔ ct., 117 50 142 50
Band,	less 5 ℔ ct., 117 50 — —
Horse Shoe,	less 5 ℔ ct., 117 50 — —
Rods, ¼ to 3-16 inch,	less 5 ℔ ct., 97 50 155 —
Hoop,	less 5 ℔ ct., 125 — 180 —
Nail Rod, less 5 ℔ ct.,	8¼ — 9¼
Sheet, Russia, as to Nos. (gold),	— 10½ — 12½
Sheet, Single, D. and T. Common,	— — 5 — 7
Sheet, Galvanized,	List 20 @ 25 ℔ cent dis.
Rails, English (gold), ℔ ton,	— — 56 50
Rails, American, at Works in Pa.,	— 74 — 76

STEEL.—Duty: Bars and Ingots, valued at 7 cents ℔ lb or under, 2½ cents; over 7 cents and not above 11, 3 cents ℔ lb; over 11 cents, 2½ cents ℔ lb, and 10 ℔ cent ad val. (Store prices.)

English Cast (2d and 1st quality) ℔ lb,	— 18 @ — 22
English Spring (2d and 1st quality),	— 9 @ — 11½
English Blister (2d and 1st quality),	— 11½ @ — 19
English Machinery,	— 12½ @ — 15
English German (2d and 1st quality),	— 14 @ — 16
American Blister, "Black Diamond,"	— 10½ @ — 16
American, Cast, Tool, "	— 19 @ — —
American, Spring, "	— 10 @ — 13
American Machinery, "	— — @ — 13
American German, "	— 10 @ — 13

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper cents ℔ lb; Manufactured, 45 per cent ad val.

	All Cash.
Copper, New Sheathing, ℔ lb,	— @ — 32
Copper Bolts,	— @ — 33
Copper Braziers, 16oz. and over,	33 @ — 35
Copper Nails,	38 @ — 40
Copper, Old Sheathing, etc., clean,	22½ @ — 23½
Copper, Chili Pig,	— @ — —
Copper, American Ingot,	22 @ — 22½
Yellow Metal, New Sheathing,	— @ — 27
Yellow Metal Bolts,	— @ — 27
Yellow Metal Nails,	— @ — 27

LEAD.—Duty: Pig, $2 ℔ 100 lbs.; old Lead, 1½ cts. ℔ lb; Pipe and Sheet, 2½ cents ℔ lb.

Galena, ℔ 100 lbs,	— — @ — —
Spanish (gold),	$6 25 @ $6 35
German "	6 25 @ 6 50
English "	6 25 @ 6 87½
Bar, (less 6 ℔ cent),	— — @ 9 25
Pipe and Sheet, "	9 50 @ 11 50

TIN.—Duty: Pig, Bars, and Block, 15 ℔ cent. ad val.; Plate and Sheets and Terne Plates, 25 ℔ cent. ad val.

	Gold, ℔ lb.
Banca	33½@ — 34
Straits	30½@ — 31
English	30 @ — —

Plates.

Fair to good brands,	Gold.	Currency.
I. C. Charcoal, ℔ box,	$8 — @ $8 37½	$11 25 @ $12 —
I. C. Coke	6 75 @ 7 50	9 50 @ 10 75
Coke Terne	5 75 @ 6 —	8 25 @ 8 50
Charcoal Terne	7 75 @ 8 25	10 87½@ 11 75

SPELTER.—Duty: In Pigs, Bars, and Plates, $1.50 ℔ 100 lb.

	Gold.
Plates, Foreign, ℔ 100 lb.	$6 37½@ $6 50
Plates, Domestic, ℔ lb.	11 @ 12

REMARKS.

IRON.—There has been a little more inquiry for Scotch Pig, but the demand is still light—dealers purchasing only as immediate wants compel; but as there is only a moderate stock, holders remain firm in their views. The sales are 250 tons Gartsherrie, ex-ship, at $38; 600 do. Glengarnock, part at $38.50; and 100 do. Eglinton, on private terms. American continues in limited request, but prices are unchanged, $42 for No. 1, and $38 @ $39 for No. 2 being the nominal quotations; 300 tons No. 1 Crane and 300 do. Gray Forge sold at a private price. There is an improved demand for new Rails, and sales have been made of 5000 tons English at $56.50 gold; 4500 do. American, delivered at the Mill, and 200 do. old T, on terms not made public. Bar from store is dull and unchanged.

STEEL is without change.

COPPER.—A large business was done yesterday. The Lake Companies sold 2½ million lbs, mostly on speculation, on private terms, probably a trifle below 22c. From 500,000 to 600,000 lbs Baltimore and Lake have been sold from second hands at 21½c @ 22c. The manufacturers have bought sparingly, and are said to be still well supplied. For September delivery 22½c. @ 22½c. has been paid. The market closes quiet, and although the article is undoubtedly cheap, there is still less inclination than usual at this season to buy on speculation, partly because the European markets are falling. The immense shipments from Chili, amounting, in May, 1869, to 5500 tons pure copper against 2300 tons same month, 1868, will probably exercise a further depressing influence in England and France.

The London market was quoted on July 23d, £68, but has since declined to £67.

TIN is in good demand from the trade. Sales, since Monday, 2500 slabs; Straits at 29½c @ 30½c. gold. It is to-day nominally 31c.; Banca nominally 35c, and English 31c, but without stocks.

The dealers are almost bare of stock.

LEAD is dull at $6 25 @ $6.30 gold, for ordinary foreign. About 700 tons for future delivery have been sold by the makers' agents to manufacturers.

SPELTER is dull at $6.37½ nominally for Silesian, without wholesale transactions.

ZINC.—French Dry Zinc, 11½c. @ 12c.; American Dry Zinc, 8c. @ 8½c.; Metallic Zinc, 12c.; Duty 2½c. per pound.

BLACK OXIDE MANGANESE.—Pembroke Brand, Lump, 4½c.; Powdered, 5c.

Mining Stocks.

NEW-YORK, August 5th, 1869.

AGAIN we have to chronicle an advance in prices of Mining Stocks. At yesterday's meeting of the Board, sales of Smith & Parmelee were made at $2.75, and La Crosse brought 20c. The general tone of the market, however, is weak, in sympathy with the general dulness which pervades nearly all kinds of business. Our Petroleum list also exhibits an advance in prices of some of the leading stocks. Sales of Central were made yesterday at 65c., and United States went off at 80c.

Benton Gold	$ —	15
Consolidated Gregory	1 85	1 95
Grass Valley	40	50
Gunnell Gold	—	50
La Crosse Gold	19	—
Mariposa	9	—
" pfd	16 00	—
Quartz Hill	1 09	1 15
Smith & Parmelee Gold	2 70	2 80
Combination Silver	2 00	4 00
Quicksilver	15½	16
Davidson Copper	—	30
Flint Steel River	—	4 00
Wallkill Lead	9	—
Wallkill, assented	15	20
Tudor Lead	3 75	—
Cumberland Coal	34	35
Lehigh and Susquehanna Coal	75	—
Beauchoff Petroleum	25	—
Brevoort	1 80	—
Buchanan Farm	50	—
Central	60	65
Home Petroleum	4 25	—
Northern Light	45	—
Pithole Creek	1 95	—
Rynd Farm	20	—
United Petroleum Farms	18	20
United States	80	85
Rathbone Oil	35	—
Phillips	14	20

SAN FRANCISCO, CAL., August 4, 1869.

Stocks.	*Bid per ft.*	*Share.*
Gould & Curry	102½	
Savage	81	79⅞
Chollar Potosi	24	
Ophir	19¼	19
Hale & Norcross	109	107
Crown Point	36	34
Yellow Jacket	46	45
Belcher	20	21
Imperial	55	
Alpha		
Kentuck	210	209
Amador		

SAN FRANCISCO, CAL., July 22, 1869.

WHITE PINE.

	Bid.	*Asked.*
Aurora Con	$12½	$20
Chloride Con	12	—
Featherstone	—	2
Hidden Tr. Con	—	1½
Mammoth	1½	1½
Nooonday	½	1½
Orig. Hidden Tr	20	20½
Pocotillo	—	5
Pogonip and Oth'o	16	20
Virginia	7	12

IDAHO.

Golden Char't	37½	40
Rising Star	1½	—
Silver Cord	5	—

DIVIDENDS, ASSESSMENTS, ETC.

Chollar Potosi Company report a dividend payable August 6th, of $2, coin, per share.

The Ophir Silver Mining Company announce assessment No. 1 of $3 per share, in coin. Levied, July 22d, 1869. Delinquent, August 25th, 1869. Delinquent Sale, September 16th, 1869.

At the recent annual election of the Yellow Jacket Company, John B. Winters was elected President; T. C. Taylor, Vice-President; Trustees—J. B. Winters, T. C. Taylor, William Sharon, D. Driscoll, and J. B. Storer. They voted $25,000 in aid of the sufferers by the late fire in this and adjoining mines.

Assay Office Report.

Statement of the business at the United States Assay Office at New-York, for the month ending July 31st, 1869:

Deposits of gold—		
Foreign coins	$12,000	
Foreign bullion	80,000	
United States bullion	913,000	
		1,005,000 00
Deposits of silver, including purchases—		
Foreign coins	$19,000	
Foreign bullion	12,000	
U. S. bullion (cont'd in gold)	12,000	
U. S. bullion (Colorado)	10,000	
U. S. bullion (Lake Superior)	2,000	
U. S. bullion (Nevada)	30,000	
		85,000 00
Total deposits, payable in bars	$935,000	
Total deposits, payable in coins	155,000	
		1,090,000 00
Gold bars stamped		563,483 70
Silver bars stamped		39,499 72
Transmitted to U. S. Mint, Philadelphia, for coinage		$35,539 59

COAL SHIPPERS.

POWELTON COAL AND IRON CO.,
SOLE MINERS AND SHIPPERS
Of the celebrated
POWELTON
Semi-Bituminous Gas and Anthracite Coals,
104 WALNUT STREET, PHILADELPHIA.
BRANCH OFFICES:
New-York, Trinity Building; 17 Doane-street, Boston; Cleveland, O; Pittsburgh, Pa. Jan. 30-6m-is.

SAMUEL BONNELL, JR.,
Offers for Sale his
SUGAR CREEK
AND
HONEY BROOK
LEHIGH COALS,
OFFICE—43 AND 45 "TRINITY BUILDING,"
111 BROADWAY, N. Y.

HONEY BROOK COAL COMPANY,
Exclusive Miners and Shippers of the Celebrated
HONEY BROOK LEHIGH COAL,
No. 111 BROADWAY, NEW-YORK.
JAS. H. LYLES, Agent.
Wharves, Port Johnson, N. J. Philadelphia Office, 209 Walnut-street.
Apr. 20 1y J. B. McCREARY, President.

WILKESBARRE COAL,
Delivered Direct from the Mines of
The Wilkesbarre Coal and Iron Co.,
OR FOR RESHIPMENT AT
HOBOKEN AND JERSEY CITY.
Office, No. 80 Broadway,
April 1-1y NEW-YORK.

WHITE, FOWLER & SNOW,
Successors to JOHN WHITE & CO.,
Wilkesbarre and Lehigh Coal,
FOR STEAM AND FAMILY USE.
OFFICE,
ROOM NO. 75, 111 BROADWAY (Trinity Building).
JNO. WHITE. LINDLEY H. FOWLER. LOUIS T. SNOW.
Jan. 1-1y

DAY, HUDDELL & CO.,
MINERS AND SHIPPERS OF
HARLEIGH LEHIGH COAL,
And the Celebrated
HICKORY, BROAD MOUNTAIN, EXCELSIOR, SHAMOKIN AND NEW-ENGLAND RED ASH.
OFFICES,
ROOM 51, TRINITY BUILDING, 111 Broadway.
Philadelphia, 109 WALNUT STREET. Boston, 7 DOANE STREET.
Ap. 20-1y

COXE BRO.'S & CO.,
Cross Creek Colliery,
Miners and Shippers of the Celebrated
Cross Creek Free Burning Lehigh Red Ash Coal,
FROM THE BUCK MOUNTAIN VEIN.
OFFICES:
Philadelphia, No. 341 Walnut Street. | Drifton, Jeddo P. O., Luzerne Co., Pa.
Agent in New-York, SAMUEL BONNELL, JR., Room 43, Trinity Building,
Feb.-1y 111 Broadway.

H. N. BURROUGHS, Pres't. H. T. SHILLINGFORD, Sec'y.
H. H. SHILLINGFORD, Treas.
KITTANING COAL COMPANY,
SOLE MINERS AND SHIPPERS OF
BITUMINOUS COAL,
FROM THE COLLIERIES:
Tunnel Hill (LEMON VEIN), Gallitzin Cambria Co.
Beaverton (PHŒNIX VEIN), Osceola Mills, Clearfield Co.
Unequalled for Steam, Rolling Mills, Forges, Glass Works, Brick Kilns, Lime Kilns, and Coke, for the Manufacture of Steel, etc.
OFFICE:
125 South Fourth Street (Forrest Place).
July 6-6mo

PICTOU COAL!
The undersigned are prepared to contract for the delivery of *this well-known* COAL, either on board vessel at Pictou, or at any port in the United States.
Sample parcels sent as required.
BIRD, PERKINS & JOB,
39 INDIA WHARF, Boston. 86 SOUTH ST., New-York.
Aug. 10-3m

COAL SHIPPERS.

Pier No. 14 North Pt. Richmond.
C. J. & J. H. EASTWICK & CO.,
SHIPPERS OF
WHITE AND RED ASH COAL.
No. 228 DOCK STREET, PHILADELPHIA, and No. 19 DOANE STREET, BOSTON.
BURNSIDE RED ASH, SHAMOKIN WHITE ASH, LOCUST MOUNTAIN WHITE ASH COAL.
Jan.1y-is s.a.

THE DESPARD COAL COMPANY
OFFER THEIR SUPERIOR
DESPARD COAL
To Gas Light Companies throughout the country.
MINES IN HARRISON COUNTY, West Virginia.
WHARVES, LOCUST POINT, COMPANY'S OFFICE, No. 29 South St., } Baltimore.
AGENTS:
PARMELE BROTHERS, No. 32 Pine St., New-York.
BANGS & HORTON, No. 31 Doane Street, Boston.
Among the consumers of Despard Coal we name: Manhattan Gas Light Co., New-York; Metropolitan Gas Light Co., New-York; Jersey City Gas Light Co., Jersey City, N. J.; Washington Gas Light Co., Washington, D. C.; Portland Gas Light Co., Portland, Me.
☞ Reference to them is requested. May 30-1y

LEWIS AUDENRIED & CO.,
Miners and Shippers of the following celebrated
ANTHRACITE COALS.
From Philadelphia and the Mines.
DIAMOND, Red Ash; SPOHN, Red Ash; ORCHARD, Pink Ash; BROAD MOUNTAIN, White Ash; LOCUST MOUNTAIN, White Ash; BLACK HEATH, White Ash; OLD COMPANY'S LEHIGH; WILKESBARRE.
From Port Johnston and Jersey City,
OLD CO.'S LEHIGH, HAZLETON, WILKESBARRE, AND SHENANDOAH COALS.
Also the superior CUMBERLAND COALS,
BROAD TOP, SEMI-BITUMINOUS, at Philadelphia. BARTON, GEORGES CREEK, at Baltimore. BARTON, GEORGES CREEK, at Alexandria.
203 Walnut Street, PHILADELPHIA; 14 Kilby Street, BOSTON; 34 Westminster Street, PROVIDENCE; 21 Second Street, BALTIMORE.
110 BROADWAY, NEW-YORK.
July 13-1y

English Coal and Cannel.
DESPARD COAL, from Baltimore,
PROVINCIAL COAL,
ANTHRACITE COAL.
For sale in lots to suit.
PARMELE BROS.,
Agency of OSCAR I. VAN WART, Liverpool.
OFFICE, NO. 32 PINE STREET, NEW-YORK.
Yard, West 22d Street, near 10th Avenue.
Feb.27-1y

W. D. CRANE & CO.,
SHIPPERS OF
Anthracite and Bituminous
COAL,
For Iron and Steam Purposes.
NEW-YORK: 115 Broadway. | BOSTON: 26 Kilby Street.
Apr.10-tf

VAN WICKLE & STOUT,
Miners and Shippers of
FULTON & STOUT
LEHIGH COALS.
Office, 119 Broadway, Room 18, New-York.
Our Fulton Lump is a Superior Article for FOUNDRY USE. Feb.20-1y

MORRIS & BRAMAN,
SHIPPERS OF
Lehigh, Wilkesbarre, Hazleton, Chauncey, Red Ash, and Bituminous
COAL.
Office, 47 Trinity Building, 111 Broadway, New-York.
E. L. MORRIS. J. A. BRAMAN.
Apr.24-tf-q

G. B. LINDERMAN & CO.,
MINERS,
Sugar Loaf, Lehigh Coal.
OFFICE:
50 TRINITY BUILDING,
May 23-1y 111 BROADWAY, N. Y.

TYLER & CO.,
SOLE AGENTS FOR THE SALE OF
J. J. Conner's "Girardville" and "McMichael" Locust Mountain and "Duncan" Red Ash Coals.
Also, dealers in the best varieties of Lehigh, Shamokin and Wilkesbarre
COALS.
16 TRINITY BUILDING, New-York.
19 DOANE STREET, Boston.
328 WALNUT STREET, Philadelphia.
HATCH & TYLER, Hartford, Conn.
May 1-1y Box 1371, P. O., N. Y.

RANDOLPH BROTHERS,
SOLE AGENTS OF THE ORIGINAL
SPRING MOUNTAIN LEHIGH COAL,
Extensively Used for Smelting Iron.
ROOMS, 28 AND 30, TRINITY BUILDING,
NEW-YORK.
Apl. 6-tf

ENGINEERS.

P. H. VAN DER WEYDE, M.D.,
Professor of Chemistry and Metallurgy,
N. Y. DENTAL COLLEGE,
(Late Professor of the N. Y. Medical College, of Mechanics, etc., at the Cooper Institute, and of Industrial Science at the Girard College, Philadelphia.)
Analytical and Consulting Chemist and Engineer.
RESIDENCE—73 Seventh Street.
LABORATORY—Twenty-third Street, cor. of Sixth Avenue.
OFFICE—37 Park Row, New-York City.
Jan. 30-tf-

LABORATORY
OF THE
ATLANTIC QUARTZ CO.,
3045 and 3047 Chestnut St., Philadelphia,
Under the Direction of
CHARLES P. WILLIAMS,
Late Professor of Analytical and Applied Chemistry, Polytechnic College of the State of Pennsylvania, for the Analysis, Assay and Valuation of Ores, Minerals, Fertilizers and Commercial Products, and for instruction in Analytical, Experimental and Technical Chemistry.
☞ Special attention given to Fertilizers.
Feb. 20-1y-is

R. P. ROTHWELL,
Mining and Civil Engineer and
METALLURGIST,
From the Imperial School of Mines, Paris, Member of the Geological Society of France, etc.
OFFICE, WILKESBARRE, PA.
Having had a large practical experience in Europe and this country, is prepared to examine and report on all kinds of Mineral property, superintend Mines and Metallurgical Works, Assay Ores, etc. 18-2-qp

BENJAMIN SMITH LYMAN,
Mining Engineer, Geologist and Topographer,
No. 135 South Fifth Street, Philadelphia.

T. B. BROOKS, C. E.,
Expert in Iron Ores, Mines,
And Blast Furnaces,
(ASSISTANT ON GEOLOGICAL SURVEY OF MICHIGAN,)
May 7-3m Negaunee, Marquette Co., L. S., Mich.

Adolph Ott, Chemical Engineer,
May be employed professionally as an expert on practical subjects, involving both Chemical and Mechanical knowledge. A specialist in various branches of Technology. Assays and Analyses of all kinds. Address, Editorial Rooms of the "Engineering and Mining Journal," 37 Park Row, New-York City.
☞ Written communications preferred. Nov. 28-tf.

GEO. W. MAYNARD,
PROFESSOR OF MINING AND METALLURGY,
Rensselaer Polytechnic Institute, Troy, N. Y.,
is open to engagement for the summer months for the examination of Mining Property, or for any work bearing upon Mining or Metallurgy. June 12-tf

INSTRUCTION.

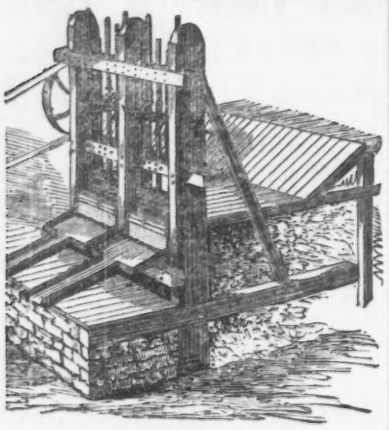
School of Mines, Columbia College.
FACULTY.—F. A. P. BARNARD, S.T.D., LL.D., PRESIDENT; T. EGLESTON, JR., E. M., Mineralogy and Metallurgy; F. L. VINTON, E. M., Mining Engineering; C. F. CHANDLER, PH. D., Analytical and Applied Chemistry; JOHN TORREY, M.D., LL.D., Botany; C. A. JOY, PH. D., General Chemistry; W. G. PECK, LL.D., Mechanics; J. H. VAN AMRINGE, A.M., Mathematics; O. N. ROOD, A.M., Physics; J. S. NEWBERRY, M.D., LL.D., Geology and Paleontology. Regular courses for Mining Engineering; Metallurgy; Geology and Natural History; Analytical and Applied Chemistry. Special students received for any of the branches taught. Particular attention paid to assaying. For further information and catalogues, apply to
DR. C. F. CHANDLER, Dean of the Faculty.
Nov. 21-1y-is

Rensselaer Polytechnic Institute,
TROY, N. Y.
A School of Engineering and Practical Science.
FOUNDED 1824.
The courses of instruction, each extending over four years, are
1. Civil Engineering. 2. Mining Engineering. 3. Mechanical Engineering. 4. Natural Science.
Degrees conferred in the different departments.
Applicants for admission must not be less than 16 years of age.
The course in Geodesy includes extensive engineering field practice. The proximity of iron, steel, and machine works, together with railroads, canals, and bridges, affords great facility for thorough practical instruction. Laboratory privileges unsurpassed. Special courses in assaying.
For Annual Register giving full particulars apply to
July 6-1y Prof. CHARLES DROWNE, Director.

E. B. ELY & CO.,
SHIPPERS OF
COAL,
33 Trinity Building, 111 Broadway,
NEW-YORK.
"Old Company's" Lehigh, J. H. Swoyer's Enterprise, Wyoming, Wilkesbarre, and Locust Mountain Bituminous Coal.
E. B. ELY. S. W. ELY.
Apr. 24-1y-q

MINING MACHINERY, ETC.

Mining Machinery and Supplies.



CALIFORNIA STAMP MILLS,

With Iron or Wood Frames.

WHEELER & RANDALL'S

PATENT

Excelsior Grinder and Amalgamator.

Conoidal Separator and
Tabular Concentrator,

With Self-Discharging Quicksilver Apparatus.

HEPBURN & PETERSON'S

Pan and Separator.

Rock Breakers, Retorts, Engines, Boilers, and Shafting, Shoes and Dies of the best White Iron and Steel.

Plans, Drawings, and Specifications for Quartz Mills furnished, and practical information in Mining, Milling, Amalgamating and Concentrating Gold and Silver Ores given.

Agents for UNION IRON WORKS, San Francisco.

MOREY, SPERRY & CO.,
95 Liberty Street, New-York.

F. MOREY, J. A. SPERRY. P. M. RANDALL.
Oct.10-1y-ls

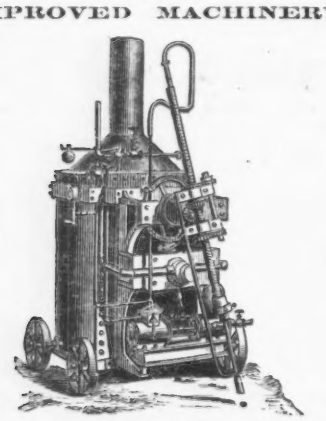
PATENT DIAMOND DRILLS,

FOR

MINING, QUARRYING, SHAFTING, TUNNELING, WELL-BORING, PROSPECTING, AND SUBMARINE BLASTING,

WITH

IMPROVED MACHINERY,



Adapted to all kinds of rock-drilling. Ordinary rock bored at the rate of

4 to 6 Inches per Minute.

Mines and Quarries tested in the most satisfactory manner by taking out TEST CORES from any depth. For full information and price list, addddress

SEVERANCE & HOLT,

PROPRIETORS AND MANUFACTURERS,
MIDDLEBURY, VT.,
AND
Nos. 14 and 16 Wall Street.
Mar. 27-3m-ls NEW-YORK.

KROM'S DRY ORE CONCENTRATOR.

Concentration by means of Air

has long been attempted, but hitherto without satisfactory results. **S. R. KROM** has invented and patented machines which concentrate the various ores more perfectly than can be done by any other means.

The **Mechanical Combinations** are extremely simple, the machines therefore correspondingly durable. A continuous self-delivery of ore on one side and tailings on the other is effected, hence very little attention is required except keeping the hopper supplied with ore. The power of one man is sufficient to operate a machine that will concentrate one ton per hour.

Parties Interested in Mining are invited to call at No. 210 Eldridge Street, New-York, where they may see a machine in operation, and have samples of their own ores crushed and concentrated.

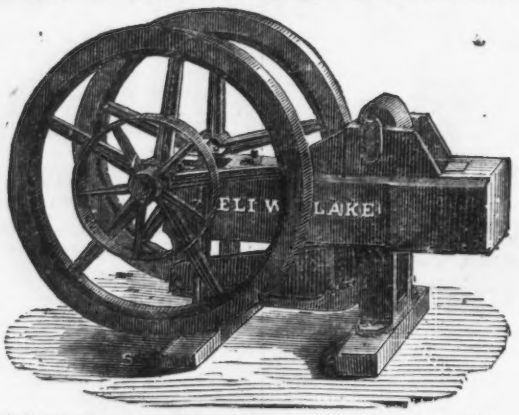
Illustrated Circulars may be had on application to

STEPHEN R. KROM,

Jan.10-1y-ls No. 210 Eldridge Street, N. Y.

MINING MACHINERY.

BLAKE'S STONE BREAKER.



The office of this Machine is to break Ores and Minerals of every kind into small fragments, preparatory to their further comminution by other machinery.

This machine has now been in use, enduring the severest tests, for the last ten years, during which time it has been introduced into almost every country on the globe, and is everywhere received with great and increasing favor as a labor-saving machine of the first order.

Illustrated circulars, fully describing the machine, with ample testimonials to its efficiency and utility, will be furnished on application, by letter, to the undersigned.

☞ The Patents obtained for this machine in the United States and in England having been fully sustained by the courts, after well-contested suits in both countries, all persons are hereby cautioned not to violate them; and they are informed that every machine now in use or offered for sale, not made by us, in which the ores are crushed between upright convergent faces or jaws actuated by a revolving shaft and fly wheel, are made and used in violation of our patent.

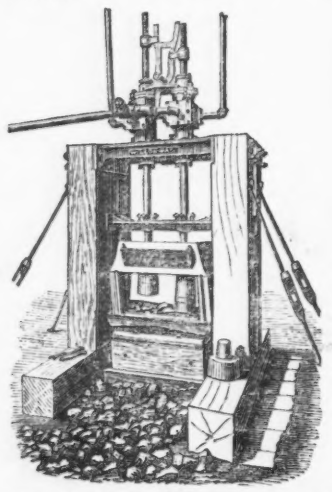
March 14-1y 351 **BLAKE BROTHERS, New-Haven, Conn.**

THE WILSON PATENT

STEAM STAMP-MILL COMPANY,

OF PHILADELPHIA, PA.

Are now prepared to supply Miners and other parties with their



NEW STEAM STAMP-MILLS

AT THE SHORTEST NOTICE.

These Mills have now been in operation for upward of a year, and have proved to be the most durable and efficient, as well as the lightest for transportation, of any Mills now used. The valve gear is of the simplest and most durable construction, readily adjustable by movable cams on the piston rods or stamp stems, thereby giving the operator absolute control of the length and velocity of motion and force of the blow. These Mills are adapted for both dry and wet crushing, and for the hardest rock or softest cement. These Mills are every way equivalent to a Twenty Stamp Mill. For full particulars, call on or address

THE WILSON PATENT STEAM STAMP-MILL COMPANY,

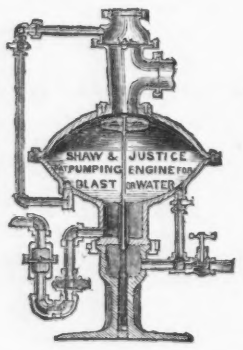
326 WALNUT STREET, PHILADELPHIA.
May 7-1y

PHILIP S. JUSTICE,

No. 14 North Fifth Street, Philadelphia,

No. 42 Cliff Street, New-York,

MANUFACTURER OF



Engines for Water-Works, Mines, Blast-Furnaces, etc.

ONE HALF OF THE POWER AND PRICE SAVED, AND EFFICIENCY GUARANTEED. Aug. 3

GREAT WESTERN

Mining and Manufacturing Company.

CHAS. HENDRIE, President.

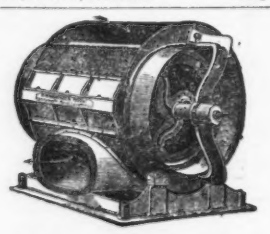
MANUFACTURES OF MINING MACHINERY,

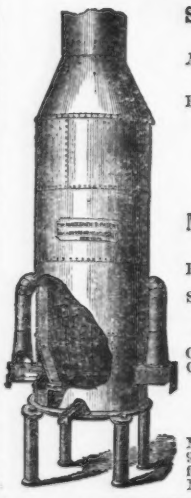
AND WHOLESALE DEALERS IN

Mining Supplies.

Our list of patterns includes all the improved processes for the procuring and saving of Gold and Silver from the ores, and it is the intention of the company to procure the right to manufacture all new improved mining machinery as fast as brought before the public. Our list, in part, is composed of the following machinery: Quartz Mills, stamps of any weight desired. Engines and machinery for same, of any size or description known to the trade. Amalgamators, Crushers, Desulphurizers, Engines, portable, hoisting, and pumping, of the most approved construction. Saw Mills, portable or stationary. Shingle Machines, H. H. Low's Patent. We also furnish in lengths to suit, Steam and Conducting Pipes, Steam Gauges, Brass Fixtures, Bolts, Belting, and, in fact, every thing needed by Mining Companies. Our works are located at the following places: BURLINGTON, Iowa; COUNCIL BLUFFS, Iowa; CENTRAL CITY, Colorado, and HELENA, Montana. The advantage of ordering machinery of us will be plainly seen from the fact of our having branches of our works in the mining regions, thereby enabling the companies to procure their repairs there, without having to send back to the States for same, which they would be compelled to do did they procure their machinery at an Eastern shop. Our prices here are the same as the Eastern prices, thereby saving to the companies the extra expense of freight to the West. We will contract to deliver freight at any point on the Missouri River, and will be prepared to send a competent man to superintend the erection of the machinery at the mill if desired. Plans and specifications of the mills furnished to all ordering machinery of us. We would be pleased to receive an order from you for any thing in our line, and feel confident we can fill it to the satisfaction of your company. All orders for machinery should be addressed to WM. C. HENDRIE, Secretary, Burlington, Iowa. Address for information to C. F. HENDRIE, Council Bluffs, Iowa. CHAS. HENDRIE, Helena, Montana. May 29-6m

---





SMITH & SAYRE

MANUFACTURING CO.,

PROPRIETORS AND MANUFACTURERS

OF THE

Mackenzie Patent

BLOWER and CUPOLA and SMELTING FURNACE.

Also, Mackenzie's Patent GAS EXHAUSTER and COMPENSATOR. Address

SMITH & SAYRE

MANUFACTURING COMPANY, 95 Liberty Street, N. Y. Send for illustrated pamphlet.
Mar. 26-1y

English Gun Cotton.

About 1500 pounds very superior ENGLISH GUN COTTON,

IN WATER-PROOF COVERING,

(surplus stock) may be had at less than cost of importation. Address

A. K. P. Welch,

Agent of Commonwealth of Massachusetts,
Apr. 10-tf CAMBRIDGE, MASS.

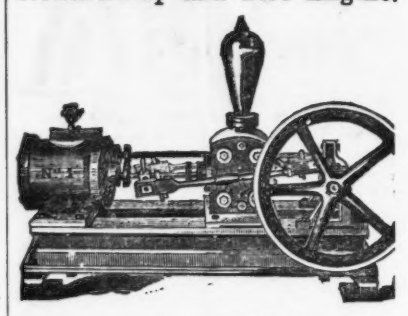
STEAM PUMPS.

THE WOODWARD
Steam Pump Manufacturing Co.

Manufacturers of the

Woodward Patent Improved Safety

Steam Pump and Fire Engine.

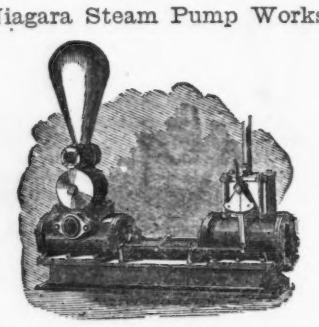


STEAM, WATER, AND GAS FITTINGS OF ALL KINDS.

Also dealers in WROUGHT IRON PIPE, BOILER TUBES, etc. Hotels, Churches, Factories, and Public Buildings, heated by Steam, Low Pressure.

Woodward Building, 76 and 78 Centre-street, corner Worth-street, New-York. Formerly 77 Beekman street.
Mar.14-1y GEORGE M. WOODWARD, President.

Niagara Steam Pump Works.



CHARLES B. HARDICK,

NO. 9 ADAMS STREET, BROOKLYN, N. Y.

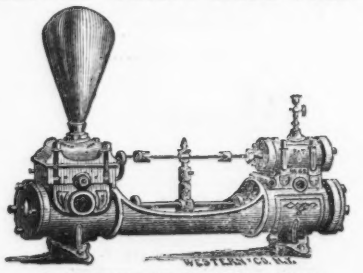
SOLE MANUFACTURER OF

HARDICK'S PATENT DOUBLE-ACTING

STEAM PUMP AND FIRE ENGINE.

Patented in England, Belgium and France. Send for circular. f13

KNOWLES' PATENT STEAM PUMP.



FACTORIES AT WARREN, MASS.

WAREHOUSE, NO. 126 LIBERTY STREET, NEW-YORK.

Air Pumps, Blowing Engines, Hydraulic Pressure Pumps, New Locomotive Pumps, Fire Pumps, Boiler, Feed, Marine, Drainage, Sugar-work, Brewery, Distillery, Oil and Wrecking Pumps.

Improved Horizontal and Vertical

MINING PUMPS

(Working with Plungers, and especially arranged for pumping water containing dirty or gritty matter).

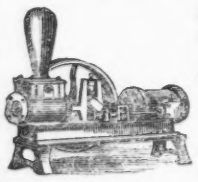
Pumps for every possible duty, and all fully guaranteed. Also,

Knowles' Patent Safety Boiler Feeder.

Send for an Illustrated Circular. July 10-1y

J. CLAYTON'S

Patent Fly Wheel and Direct Action



Steam Pumps,

HAND PUMP AND STEAM ENGINE COMBINED.

These Pumps are the cheapest first-class pumps in the market.

All sizes made to order at short notice.

JAMES CLAYTON, 24 & 26 Water Street,
Nov.18-tf BROOKLYN, N. Y.

FRYER'S
AIR PUMP,

Compresses Air or Gas to any Required Pressure.

Fryer's Improved Water Pump,

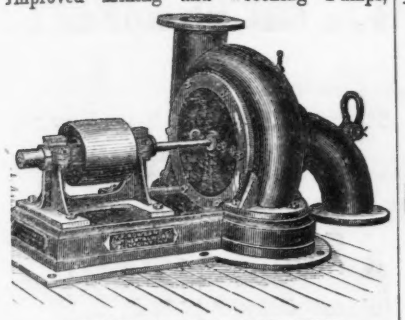
MANUFACTURED AND SOLD BY

FRYER BROS. & CO.,

Jan.16-1y No. 10 WALL STREET, Room 43, N. Y

STEAM PUMPS.

Improved Mining and Wrecking Pumps,



LEBBY & DUC PATENTS,

MANUFACTURED SOLELY BY

T. F. ROWLAND, CONTINENTAL WORKS,

Greenpoint, Brooklyn, N. Y.

New-York Office, No. 64 Broadway, Room 33.

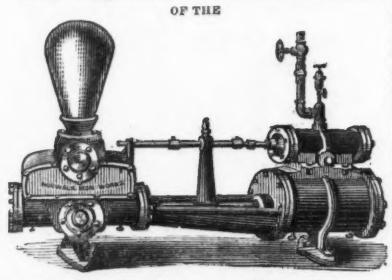
☞ Send for Illustrated Circular. July 16-6m-is

NORWALK IRON WORKS,

SOUTH NORWALK, CONN.,

Sole Proprietors and Manufacturers

OF THE



Earle Steam-Pump & Fire-Engine,

(Patented in the United States, France, England and Belgium.)

Air and Vacuum Pumps,

STEAM AND BLOWING ENGINES,

Pumping-Engines for Water Works, Horizontal and Tumbling Beam Engines, Mining, Wrecking, and Supply Pumps.

IRON AND BRASS CASTINGS, of every Description.

☞ Send for Illustrated Catalogue. Mch. 13-1y-is

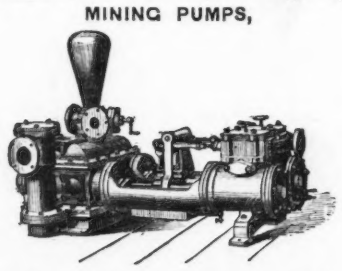
HYDRAULIC WORKS.

MANUFACTORY,

BROOKLYN, N. Y.

Steam Pumping Engines, Single and Duplex, Worthington's Patent, for all purposes, such as Water Works Engines, Condensing or Non-condensing; Air and Circulating Pumps, for Marine Engines; Blowing Engines; Vacuum Pumps, Stationary and Portable Steam Fire Engines; Boiler Feed Pumps, Wrecking Pumps,

MINING PUMPS,



Water Meters, Oil Meters; Water Pressure Engines; Stamp Mills for Gold, Silver, and Copper Ore; Eaton's Patent Amalgamators for Gold and Silver; Steam and Gas Pipe, Valves, Fittings, etc. Iron and Brass Castings. ☞ Send for Circular.

H. R. WORTHINGTON,

Feb. 1-1y 61 Beekman Street, New-York.

MISCELLANEOUS.

CHANNING G. FENNER. E. F. DUNNE.

FENNER & DUNNE,

COUNSELLORS AT LAW,

Treasure City, White Pine, Nevada.

REFERENCES:

FENNER & PRESTON, 66 Pearl St., N. Y. R. W. RAYMOND, Esq., New-York.

April 17-6m

SCOVILL MANUFACTURING CO.,

MANUFACTURERS OF

SHEET BRASS, GERMAN SILVER

PLATED METAL,

BRASS BUTT HINGES,

Gilt, Lasting, Brocade and Fancy Dress Buttons, Kerosene Oil Burners, and Lamp Trimmings.

And Importers and Dealers in every description of

PHOTOGRAPHIC GOODS.

No. 4 Beekman Street and 36 Park Row, New-York

Manufactory, Waterbury, Conn. Sept. 21-1y

Charles E. Harris,

GENERAL MINING AGENT,

TREASURE CITY

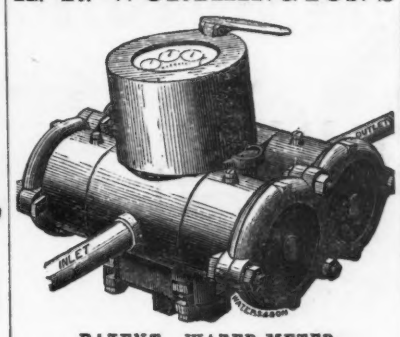
WHITE PINE COUNTY,

Nevada.

Reports and full information given regarding the Mines of this wonderfully rich Region. May 13m-

MACHINISTS' SUPPLIES.

H. R. WORTHINGTON'S



PATENT WATER-METER.

This Meter is also Used for the Measurement of Oil.

IT COMBINES

ACCURACY, SIMPLICITY, AND REMARKABLE DURABILITY,

with such ease and certainty of motion as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our larger cities.

HENRY R. WORTHINGTON,

Sept. 13-1y No. 61 Beekman Street, New-York.

LINDSAY, WALTON & CO.,

(Successors to WALTON & LEONARD,)

Machinists' and Railroad Supplies,

METALS, TOOLS, AND HARDWARE,

No. 58 John Street,

NEW-YORK.

AGENTS FOR THE SALE OF

American Bolt Co.'s Bolts, Nut Washers, etc.
Sturtevant's Pressure Blowers, Taft's Smith's Shears.
Packer's and Walworth's Ratchets, Harrington's Patent Tuyere.
Patent Differential Pulleys, Green Works, Patent Wrenches.
Dudgeon's Patent Hydraulic Jacks and Tube Expanders.
Dixon's Crucibles, Wellington Mills Emery and Emery Cloth.
Iron Pulley Blocks, Twist Drills, Portable Forges, etc.

AND A LARGE ASSORTMENT OF

Stubb's Tools and Files and Supplies for Railroads, Engineers, Manufacturers, and Machinists.

J. P. LINDSAY. J. H. LYLES. JOS. J. WALTON.

Dec. 12-1y

OLMSTED'S IMPROVED

OILER.

ALWAYS RIGHT SIDE UP.

Warranted the most durable Oiler made. The spring cannot be "set" by use, or the Oiler injured by falling. These Oilers are made of heavy Tin, Brass, and Copper, and are sold by the trade everywhere. Address

J. H. WHITE,

Newark, N. J.,

Manufacturer of SHEET and CAST METAL, small wares, Stationers' and Trunk makers' Hardware,

NOTIONS,

Patented Articles, etc., etc.

Dies and Tools, Fancy Hardware, etc., made to order.

Jul. 18-1y

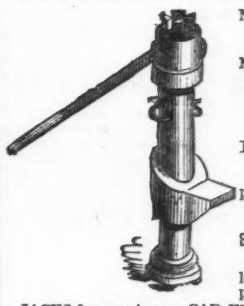
LINDSAY'S PATENT.

The merits of this Wrench are too well known to need comment. Go to the nearest hardware store and LOOK AT IT BEFORE PURCHASING ANY OTHER, or send for illustrated circular to

MANVEL & LINDSAY CO.,

Oc. 12-1y 58 John Street, New-York.

RICHARD DUDGEON,



No. 24 Columbia Street, N. Y.,

Maker and Patentee of

Hydraulic Jacks

AND

PUNCHES,

Roller Tube Expanders, and Direct-Acting

STEAM HAMMERS.

Communications by letter will receive prompt attention.

JACKS for pressing on CAR WHEELS or CRANK PINS made to order May 22-1y

MACHINISTS' SUPPLIES.

ANDREWS' PATENT

Engines, Boilers, Pumps, Hoisters.

OSCILLATING ENGINES, run at great speed. Sizes 1-2 to 250 Horse-Power.

SMOKE-BURNING AND SUPER-HEATING BOILERS are economical and Safe.

CENTRIFUGAL PUMPS, pass Sand, Coal, Corn, Gravel, etc., without injury. Capacity, 90 to 40,000 gallons per minute.

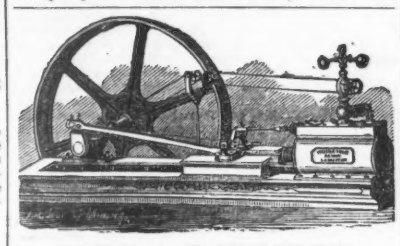
HOISTING MACHINES, run without noise; speed changed or reversed instantaneously.

ALL COMPACT, LIGHT, AND DURABLE.

Address Manufacturers,

WM. D. ANDREWS & BRO.,

July 1-1y 414 WATER STREET, NEW-YORK.



TODD & RAFFERTY,

GENERAL

MACHINERY MERCHANTS, ENGINEERS AND MACHINISTS,

Manufacturers of Stationary and Portable Steam Engines and Boilers; also Flax, Hemp, Tow, Oakum, and

ROPE MACHINERY, MILL GEARING, SHAFTING.

Lathes, Planers, Drills, Chucks, etc. Iron and Brass Castings. Judson's & Snow's Patent Governors constantly on hand.

OFFICE AND WAREROOMS, No. 10 BAR CLAY STREET, N. Y.

Office and Works, Paterson, N. J.

JOSEPH C. TODD. Oct. 27-6m PHILIP RAFFERTY.

INCRUSTATIONS

Prevented by WINANS' BOILER POWDER, 11 Wall Street, New-York.

T. S. POST & Co., Benham, Texas, say, "Since using Winans' Powder, we save ONE cord of wood per day (¼ our fuel), and have better steam, and would not be without the article for ten times its cost."

The Cleveland (Ohio) Paper Mills removed scale 22 inches long by 9 wide and 1¼ inch thick.

GAYLORD & Co., Portsmouth, Ohio, have used it for 10 years (3000 pounds yearly) without injury.

Beware of imitations. H. N. WINANS,

Jan.-tf 11 Wall St., New-York.

IRON WORK.

PATENT FINE CORRUGATED Iron Shutters and Doors,

MANUFACTURED EXCLUSIVELY BY THE

American Corrugated Iron Co.,

SPRINGFIELD, MASS.

We particularly invite the attention of owners of buildings and Insurance companies to an examination of these Shutters and Doors, which are unequalled as protectors against fire.

Practical tests have demonstrated their superior ability to resist heat, over the flat iron shutters and doors of the best and costliest kind.

As is well known, flat iron shutters will warp from heat of fire, and often of the sun.

Our Shutters *will not warp* under any circumstances. They are stiff, strong, light, and ornamental, being made to fit with exactness any opening, and particularly easy to handle, they can be used in many places where heavy shutters are impracticable.

Among our specialties in doors are

Car-House and Engine-House Doors, Heater Doors, Vault Doors.

We deliver and hang all our Doors and Shutters at any point.

Their cost is less than that of any other fire iron door or shutter.

Send for Circulars and further information.

IRON BUILDINGS.

We are erecting buildings for all purposes.

Factories, Stores, Depots, Barns, Dwelling Houses, Etc.

Our Iron Covering is acknowledged as being the best for any building, having all the dryness of wood and the durability and warmth of brick.

It meets the requirements of any city fire law, and its cost is much less than that of brick.

Plans and specifications, with estimates, furnished upon application.

IRON ROOFING.

Sixteen years of use has demonstrated that our

Patent Elastic Joint Iron Roofing

Is superior to any Roofing now in use. It is put on without any nails or any solder in the roof itself, and full allowance made for expansion and contraction. Every variety of building has been covered with it in the last few years, with most satisfactory results. We are prepared to furnish and lay the Roofing, in any quantities to suit, at short notice. July 20-tf

THE NOVELTY IRON-WORKS,

Foot of East Twelfth Street,

Branch Office, Nos. 77 and 83 Liberty Street,

MANUFACTURE

ARCHITECTURAL IRON-WORK

OF ALL KINDS.

Feb. 1-1y

STEAM BOILERS.

Root's Wrought Iron Sectional SAFETY BOILER.

Over 100 sold—tested to 300 lbs., no large sheet-iron shell to explode. Economical and durable. All sizes on hand. Also, Steam Engines, Steam Pumps, etc. Send for pamphlets and price lists.

JOHN B. ROOT,

April 24-6m-os 95 and 97 Liberty St., New-York.

WORCESTER STEAM BOILER WORKS,

MANUFACTURERS OF

Locomotive, Flue and Tubular Boilers,

Oil and Water Tanks, Gasometers, etc.,

WORCESTER, MASS.

N. B.—Boilers inspected and repaired in the best manner and at short notice.

CHAS. STEWART, Supt. D. M. DILLON, Treas.

May 15-tf

HOWARD'S SECTIONAL BOILER.

Illustrated in the AMERICAN JOURNAL OF MINING of January 16th, 1869.

For information, address

AUSTIN & GERMAIN,

Jan. 16-6m-is 37 Park Row, N. Y.

SAWS AND PLANERS.

CIRCULAR SAWS

WITH

EMERSON'S PATENT MOVABLE TEETH.

These saws are meeting with unprecedented success, and their great superiority over every other kind, both as to efficiency and economy, is now fully established.

ALSO,

Emerson's Patent Perforated Circular and Long Saws,

(All Gumming avoided,) and

EMERSON'S PATENT ADJUSTABLE SWAGE,

for Spreading, Sharpening, and Shaping the teeth o all Splitting Saws. Price, $5. Manufactured by the

AMERICAN SAW COMPANY.

Office No. 2 Jacob St., near Ferry St., New-York.

Factory, Trenton, N. J. Branch Office for Pacific Coast, No. 606 Front Street, San Francisco, Cal.

Send for new Descriptive Pamphlet and Price List.

July 1-1y

RICHARDSON, MERIAM & CO.,

Manufacturers of the latest Improved Patent.

Daniels' & Woodworth Planing Machines, Matching, Sash and Moulding, Tenoning, Mortising, Boring, Shaping, Vertical and Circular Re-Sawing Machines.

Saw Mills, Saw Arbors, Scroll Saws. Railway, Cut-Off and Rip-Saw Machines; Spoke and Wood Turning Lathes, and various other kinds of Wood-working Machinery.

☞ Catalogues and Price Lists sent on application.

MANUFACTORY, Worcester, Mass.

WAREHOUSE, 107 Liberty Street, New-York.

April 24-1y-q

Rollstone Machine Works.

MANUFACTURERS OF

BAND SAWS, ROTARY BED PLANERS,

Matching Machines, Moulding Machines, Saw Benches, Chair Lathes, Self-Oiling Pulleys, etc.

June 5-tf FITCHBURG, MASS.

DUNCAN, SHERMAN & CO.,

BANKERS,

Corner of Pine and Nassau Streets, N. Y.

Issue Circular Notes and Letters of Credit for Travellers, available in all the Principal Cities of the World.

Transfers of Money to Europe and the Pacific Coast by Telegraph.

Interest allowed on Deposits. Feb.

The Thirty-Eighth Industrial Exhibition by the American Institute

will be held between Sixty-third and Sixty-fourth Streets, on Third Avenue, in a structure so enlarged as to cover 400 feet by 170. It will be open for the reception of steam-engines and other heavy machinery on August 15th; for the reception of other articles from the 1st to the 7th of September next, and to the public on the 8th. Persons desiring to exhibit works of art, labor-saving inventions, and new products can obtain circulars and blank applications for space by writing to S. D TILLMAN, AMERICAN INSTITUTE, New-York.

Aug. 3-2t

B. KREISCHER,

NEW-YORK FIRE BRICK

AND

STATEN ISLAND

CLAY RETORT WORKS.

ESTABLISHED 1845.

OFFICE, 58 GOERCK STREET,

Corner Delancy Street, East River, NEW-YORK

Mar. 28-1y-q

PUBLICATIONS.

NOW READY.

Third Edition, Seventh Thousand, Revised, Enlarged, and Improved,

Hopton's Conversations on Mines,

BETWEEN

FATHER AND SON.

Enlarged from 112 to 192 pages.

The following are the Contents:

Air, why it is propelled down, into, and around the workings
" Quantity of, produced by the furnace
" Friction of
" The great friction of produced by one mode of ventilation, and how reduced by another
" Pure added to impure (plans)
" Splitting of (plans)
" One current of (plans)
" One current of, and how to adopt separate currents (plan)
" Dividing of, but not into "separate and distinct" current (plans)
" Crossings (see H on plans)
" Weight of in shafts
" How to find the weight of
" Table of pressure in shafts
" Expansion of
" Its velocity and force
" Rush of, into each division
" Quantity produced by natural ventilation
" Splitting, why it should be adopted
" Splitting, why the workmen object to Mr. Hopton adopting the mode
Anemometer, measurement of air by, engraving of
Area of a pit, how to find
Barometers, showing the time of an outlet of gas in mines (engraving)
Bricks, how to find the number in the walling of a shaft
Buddle's plan
Circumference of a pit, how to find
Coal, several ways of working it out, and why man methods of working it out are adopted
" Working out in banks (plans)
" Working it out in following up banks (plan)
" Working out in pillars (plans)
" Working out in long wall (plans)
" Working out in drifts (plans)
" Working out with no regularity (plan)
" Working out by the "end way" or in endings (plan)
Cubical contents of a pit, how to find
Dialing, the mode of
Dials, several engravings
" How constructed
" How fixed in mine surveying
" Needle, its variations
Diameter of shaft
Dip of mine, how to find and lay on (plan)
Explosion, the power of an
" At Lund-hill, in what part of the mine it was supposed to take place (plan)
" How the power may be diminished
Furnace, how to find the horse power of
" The place of fixing, to produce the largest ventilating current
" Engravings of ground floor, front and back view
" Remarks upon
Gases (Carbonic acid) composition of
" Do. properties of
" (After, or choke damp) composition of
" (Carburetted hydrogen) do.
" Choke damp and carbonic acid, not one and the same in quality
" The effect produced on people by inhaling such
" The quantity required for an explosive mixture
" The elasticity of
" The weight of
" The nature and quality of
" Why some mines generate and produce more than others
" Why some mines generate a mixture of
Goaf, or gob, how tramrods are made through (plan)
Lund-hill (plan)
Managers, who are best competent to manage mines
Miscellaneous questions
Natural ventilation
Planning, how workings are laid on the plan
Regulators, how to find open space
Regulations (see R on plans)
Safety Lamps, why flame will not penetrate through, " engraving of
Sections on mechanical ventilation
Summary of accidents
Surveying, how mines are with the dial
Surveying, how mines are with the theodolite
Tables of weights and measures
Temperature on surface
Temperature in mines
Temperature, difference of between down and up-cast
Theodolites for mine surveying
Theodolites, how constructed
Theodolites, the magnetic needle dispensed with, and how workings are laid on plan, with Theodolite surveying
Theodolites, how mines are surveyed with them
Up-cast larger than down-cast (plan)
Ventilating mines by mechanical power
Ventilation, several ways of
Weather, how a change of affects the workings
Workmen, capabilities of

Testimonials, Reviews, Etc.

"Such a work, well understood by miners, would do more to prevent colliery accidents that an army of inspectors."—*Colliery Guardian.*

"The book cannot fail to be well received by all connected with collieries."—*Mining Journal.*

"Its contents are really valuable to the miners of this country."—*Miner's Conference.*

"I have works priced at £4 that do not contain the same information."—W. W. KENRICK, Colliery Viewer.

"The work is replete on the subject of underground management."—M. BANKES, Colliery Proprietor.

"I have had twenty years' management. It is the best work I ever read, and deserves to be circulated in every colliery district."—JOSEPH EAMES.

WESTERN & CO.,

Sole Agents for the United States.

For sale at the office of the ENGINEERING AND MINING JOURNAL, 37 Park Row, New-York, and through any Bookseller. Price, $1.

A Most Useful Invention.

Water-pails, Buckets, Spittoons, Wash-basins, etc., made of

PAPIER MACHE,

Warranted not to break, shrink, rust, leak, water-soak or rot. Call and see specimens at the rooms of the

American Papier Mache Manufacturing Company,

11 PINE STREET, NEW-YORK CITY.

Office Box, 5242. Oct. 10-1y

PUBLICATIONS.

A Treatise on the

CONCENTRATION

OF

ALL KINDS OF ORES,

INCLUDING THE

Chlorination Process for Gold-Bearing Sulphurets, Etc.

BY GUIDO KUSTEL,

Mining Engineer and Metallurgist, Author of "Nevada and California Processes of Silver and Gold Extraction."

This work is designed to show the present condition of the art of concentration; putting forth the principles on which it is founded, without entering into scientific considerations. To make the work complete as far as possible, the processes of Dry Dressing are also briefly described therein; and the whole is so arranged and illustrated by diagrams as to enable every one to be successful in concentrating ores. As the method of reduction by stamping is considered important, the erection and treatment of stamp-works, as also the construction of grinders, are treated in full, and explained by numerous drawings.

Among the concentrating machines, the preference has been given to self-discharging continuous contrivances; and of these again to such as have been sufficiently investigated as to their efficiency, the amount of water and of power required to run them, their proportion of loss, etc.—circumstances entirely neglected with California inventions—the relative data of the latter being mere guess-work and unreliable. A short description of many less important contrivances may appear superfluous, but the knowledge of them may prevent many persons from spending time and money, as has often happened, on inventions supposed to be new.

The description of Jigging Concentration, important to Eastern lead mines, is furnished with diagrams of new continuous machines.

In addition to the strictly original matter contained in the book, facts and rules, running through its pages, are derived from the well-known valuable work (not yet finished), by Professor Gætzschmann, and from the very complete work on Concentration by Rittinger, which, although strictly scientific in its character, describes also all the practical advance which has been made upon the subject.

The treatise on the Chlorination of Gold and Silver ores is a strictly chemical one, and has no connection with that on the Dressing of Ores. It has, however, been written and published as the concluding portion of this work, in consequence of the general demand for information on the subject, and the great interest at present shown in respect to auriferous sulphurets; the extraction of the gold therefrom being difficult and unsatisfactory by many other processes.

Contents.

I. INTRODUCTION.

1. The Dressing.
2. The Separation.
3. Cleansing and Sizing Contrivances.
4. Rotary Sizers.

II. REDUCTION.

1. Reduction of Ores.
2. Description of Batteries.
3. Details of a Battery.
4. Speed, Curve, and Order of Lifts.
5. The Discharge of Batteries.
6. The Feeding of Batteries.
7. Reduction by Rolling Mills.
8. Grinding.
9. Pans with Plane Mullers.
10. Pans with Conical Mullers.
11. Pans with Tractory-Conical Mullers.
12. Pans with Perpendicular Mullers.

III. CONCENTRATION.

1. Concentration of Reduced Ore.
A. Concentration of the Grains (Jigging Stuff).
2. Movable Jiggers.
3. Stationary Jiggers.
4. Continual Jiggers.
5. Rotary Machines.
B. Concentration of Ore Sands.
6. Assorting of Sands.
7. Feeding of Concentrator.
8. Stationary Concentrators.
9. Percussion Tables.
10. Oscillating and Shaking Tables.
11. Steady-Moving Concentrators.

IV. SPECIAL CONCENTRATION.

1. Concentration of Gold Ores.
2. Concentration of Silver Ores.
3. Concentration of Lead and other Ores.

V. CHLORINATION.

Methods of Dissolving and Precipitating the Gold from Sulphurets.

Chlorination at Reichenstein.
Chlorination at Schemnitz.
Calvert's Method for Auriferous Quartz.
Extraction of Gold, Silver, and Copper.

This great work should be in the hands of every mining engineer in the country. It is the only manual in the language containing the latest improvements which science has made in the important department of concentration, and a full and detailed account of the celebrated and successful Plattner chlorination process. Both parts of the book are illustrated with diagrams and plates, so that every intelligent engineer can erect apparatus or make working drawings for himself.

PRICE, 7.50.

OR SALE BY

WESTERN & COMPANY,

37 Park Row, N. Y.

Sole Agents for the Atlantic States.

PUBLICATIONS.

THE LARGEST, BEST, AND CHEAPEST!

MOORE'S

RURAL NEW-YORKER,

THE GREAT NATIONAL

Rural, Literary, and Family Weekly,

Begins a New Half Volume July 3, 1869.

THIS FAMOUS WEEKLY, so long noted for the Ability, Variety and Usefulness of its Contents, and the Taste and Beauty of its Style, was vastly ENLARGED, BEAUTIFIED, and IMPROVED in January last, and is now not only the Leading and Most Popular, but by far the

Largest, Best, and Cheapest

NEWSPAPER OF ITS CLASS IN THE WORLD!

MOORE'S RURAL has no equal in its Sphere of Journalism—far excels in Value, Attractions an Circulation—and is a Welcome Visitor to tens of thousands of Homes in City, Village, Suburb and Country, throughout the Union, Canada, etc. In all the essentials of a Practical, Scientific, Literary, Family and General Newspaper, it surpasses any other Journal, and is pronounced the

BEST WEEKLY IN AMERICA!

With offices in New-York City and Rochester—the great Literary and Commercial Metropolis, and the Heart of a Famed Rural District—it possesses unequalled facilities; and, having Seven Editors and Hundreds of Special Contributors and Correspondents (located in various parts of the United States, Canada, and Europe), renders true the remark of an exchange, that "THE RURAL is the most elegantly printed, widely circulated, and heartily welcomed paper, as a whole, which now finds its way among the people." The RURAL is profusely illustrated with appropriate and Costly Wood Engravings.

EVERYBODY WANTS MOORE'S RURAL!

All who cultivate Fruits, Flowers, Vegetables, etc. (even on a small scale in city, village, or suburb), need the RURAL; while Farmers, Planters, Horticulturists, Stock Breeders, Wool Growers, Dairymen, Poultry Fanciers, etc., will find it invaluable. In the Family it is highly regarded, its Literary and Miscellaneous Departments furnishing Choice and Entertaining Reading for all. It is National in character and objects, and has a Continental Circulation.

FORM, STYLE, AND TERMS.

MOORE'S RURAL is published on a *Mammoth Sheet*, comprising *Sixteen Large Double Quarto Pages of Five Columns*—making it the LARGEST ILLUSTRATED PAPER IN AMERICA! Superior in Value, Variety, and Purity of Contents, printed in Extra Style, and *Adapted to both Town and Country*, it is the paper for YOU, YOUR FAMILY and FRIENDS. Examine a number and decide. ☞ Note that the RURAL is not a monthly, but the largest, best, and cheapest WEEKLY of its class—and that, though nearly double its former size, and greatly improved, its *Subscription Price Remains Unchanged!*

TERMS.—Only $3 a year—less to Clubs. Liberal inducements to Club Agents, and a live one wanted in every place where we have none. Single or club subscriptions received for six months—July to January—at half the yearly rates. As a new half volume begins July 3, now is the time to Subscribe. Drafts, P. O. Money Orders, or Registered Letters, at our risk. Specimens, Show Bills, etc., sent free to all applicants.

Address,

D. D. T. MOORE,

Aug. 3-4t **No. 41 Park Row, New-York.**

MISCELLANEOUS.

THE PHRENOLOGICAL JOURNAL

AND LIFE ILLUSTRATED

Is a First-Class Family Magazine, devoted to the **"Science of Man,"** including Phrenology, Physiology, Physiognomy, Psychology, Ethnology, Natural History, etc. It is the only journal of the kind in America, or, indeed, in the world. It is edited by S. R. WELLS, Author of New Physiognomy.

Terms.—Published Monthly, in quarto form, at $3 a year, in advance. Sample numbers sent by first post, 30 cents. Clubs of ten or more, $2 each per copy, and an extra copy to agent.

We are now offering the most liberal premiums ever given for clubs. Enclose stamps for list. We also want Local Canvassing Agents in every Town, to whom we will give the largest Cash Commissions. Address S. R. WELLS, PUBLISHER, 389 BROADWAY, NEW-YORK. Aug. 10-4t

Wood Engraving

EXECUTED AT THE

Office of The Engineering and Mining Journal,

37 PARK ROW, NEW-YORK CITY.

FOR SALE.

A Second-Hand Cameron Pumping Engine, No. 2

Has 3-inch Water Cylinder,
6-inch Steam Cylinder,
6-inch Stroke.

Will be sold extremely low for Cash. Apply to

J. H. DARLINGTON,

Cor. Centre and Franklin Sts., New-York City.

June 5-tf

Coal, Iron, and Oil,

By DADDOW AND BANNAN.

The Great Work on our National Resources.

A large Octavo Volume, 808 pages, with upward of 200 Maps and Engravings.

The *Scientific American* says: "It is the most practical and exhaustive treatise on the subject that has come under our observation, and one that deserves to be read by all intelligent men."

The London *Mining Journal* says: "A more comprehensive and exhaustive volume upon the materials treated of could scarcely be desired. . . . It may safely be said that we have no single work in this country so thoroughly calculated to afford the superior collier and iron worker all the information he requires in connection with his business."

Persons desiring to settle in the South will find this book invaluable, as it points out the best places for mining and manufacturing purposes.

The first edition is nearly exhausted, and no other edition, owing to the expense, will be published for several years. Price, $7.50, cloth; Half Turkey, $10.

☞ For sale also in New-York at the Office of the ENGINEERING AND MINING JOURNAL, wholesale and retail. Mar. 13-tf

THE MINES OF THE WEST:

A REPORT TO THE

Secretary of the Treasury.

Being a full Statistical Account of the Mineral Development of the Pacific States for the year 1868, with

Sixteen Illustrations,

and a Treatise on the Relation of Governments to Mining, with a delineation of the Legal and Practical Mining Systems of all Countries, from early ages to the present time. By

ROSSITER W. RAYMOND, Ph.D.,

U. S. Commissioner of Mining Statistics.

EXTRA CLOTH, $4.75.

Address WESTERN & CO., 37 Park Row, N. Y.

DADDOW'S NEW MAP

OF THE

Anthracite Coal Regions.

This Map is the latest published of the Anthracite Coal Regions of Pennsylvania. It differs in many respects from other Maps published, because it gives the formation and also a representation of all the collieries in the Anthracite Coal Regions, etc., etc.

Price on Rollers,	$2 50
In case for Pocket,	1 50
In Sheets,	1 22
Do. on Muslin,	1 75
Do. on Muslin dissected,	2 00

Those in Pocket form will be sent free by mail on receipt of the above prices. For sale by

WESTERN & CO.,

37 Park Row, New-York, Office of the ENGINEERING AND MINING JOURNAL. March 13-tf

GEO. H. JOHNSON,

PHOTOGRAPHIC ARTIST,

1288 BROADWAY,

(LATE OF CALIFORNIA.) NEW-YORK.

July 27-tf

"THE MANUFACTURER & BUILDER."

ITS GREAT SUCCESS! WHY PEOPLE SUBSCRIBE TO IT!

REVIEW OF ITS CONTENTS OF THE PAST SIX MONTHS.

Show it to your Friends.

The success which has attended our efforts to provide a first-class Monthly, devoted to the interests of the industrial classes, has far exceeded our most sanguine anticipations. The Manufacturer and Builder has been received with favor by every class of the community. Manufacturers have taken it for the information which it gives in regard to the improved processes in which they are interested; mechanics have taken it for the instruction which it conveys in regard to matters pertaining to special arts and trades; professional and literary men have taken it for the information which it conveys in regard to the progress of the industrial arts; people, in general, have taken it because it contains much pleasant reading matter for the family circle. That all these classes have been right in their estimate of this journal, will be evident to any one who will read the Table of Contents which we here append. When we state that these articles are almost all derived from original and authoritative sources, it will be seen that we have presented a body of **PRACTICAL, THOROUGH, AND RELIABLE INFORMATION,** such as can nowhere else be obtained for the sum charged for a year's subscription to The Manufacturer and Builder.

Subscription $1.50 per Annum, with Liberal Club Rates and Premiums.

Table of Contents of the First Half-Volume of "The Manufacturer and Builder,"

[ILLUSTRATED ARTICLE'S ARE MARKED WITH AN ASTERISK.]

JANUARY.

*Gold and Stock Telegraphy,.... 1
Persian Arms, Damask Steel, and Damaskeening,.... 2
How to cause a Tempest in a Teapot,.... 2
The Causes of the Difference in the Color of Bricks,.... 3
How to make different Cements,. 3
Learned Blacksmiths,.... 3
*Dove-Tail Joints,.... 4
Wall-damp,.... 5
The Utilization of Tin Scraps,.... 6
The Firmness of Paper,.... 6
New City Buildings,.... 7
*Have you ever looked through a Microscope?.... 8
The Mechanic and his Work,.... 8
Reversible Seats,.... 9
Preventive of the Decay of Wood,. 9
Colorado Manufactures,.... 9
Chemical Engineering,.... 10
The New Art of Fresco-Painting, 10
"Old Says" on Building,.... 11
The Progress of Building,.... 11
Chrome-Yellow Paint,.... 11
*Hints for Sign-Painters,.... 12
Imitation-Marble,.... 13
Common Mortar,.... 13
New Paint for Floors,.... 13
Apatite; Its Importance in Domestic Economy,.... 14
Gun-Cotton,.... 14
The Preservation of Wood by Immersion,.... 14
Ventilation and Heating by Currents,.... 14
Ventilation and Heating by Currents,.... 15
Cement and Mortar of the Ancients,.... 15
Bridging the Missouri,.... 16
*The Park Bank Building—A Palace of Finance,.... 17
The Air in Lecture and School-Rooms,.... 18
Prize Problems,.... 19
Glass,.... 19
*Improvement in Saws,.... 20
Hoosac Tunnel,.... 21
*Deep-Sea Cables,.... 22
An Important Invention,.... 22
To the Public,.... 22
Trades' Unions in the United States,.... 23
Literary,.... 23
Mechanics' Homes,.... 24
*Long Island Villa, with Mansard Roof,.... 24
*Villa Cornice Work,.... 25
Children's Toys,.... 25
To the Press,.... 26
Occupations and Wages in California,.... 26
Queries,.... 27
Special Notice to Travellers,.... 27
Advertisements,.... 27

FEBRUARY.

*Portable Wainscoting,.... 33
Ventilation and Warming,.... 34
A Few Words about Bricks,.... 35
*The Bessemer Process and its Late Improvements,.... 35
Wire-Rope,.... 37
Hollow Walls,.... 39
Rock-Drilling Machine,.... 39
Mr. Mudge on Woolen Manufactures,.... 39
*Water-Proofing Dress Goods,... 40
Insoluble Cements,.... 40
Atmospheric Action on Building-Stones,.... 40
*Anatomy of the Screw,.... 41
Lead Pencils,.... 41
Artificial Light and the Subject of Ventilation,.... 42
Architecture and Civilization,.... 43
Arches—Old and New,.... 43
*Manufacture of Sheet Tin,.... 44
Rates of Travel,.... 44
*Hand-Power Machine,.... 45
The History of Windows,.... 45
To Restore Burnt Cast-Steel,.... 45
To Bleach Palm-Oil,.... 45
The Building-Stone and Slate of Virginia,.... 46
The New-York Milling Interest,. 47
*The New-City Post-Office,.... 48
Review of City Buildings,.... 50
Decay of Wood and Processes for Preserving it,.... 51
The Daguerrean Process,.... 51
To obtain Different Shades of Chrome-Yellow,.... 52
*Improved Cupola and Blower,... 52
Literary,.... 54
Real Estate for Workingmen,.... 55
The Philosophy of Building,.... 55
*Villa and Cottage Architecture,. 56
Consumption of Milk,.... 57
Trades and Professions,.... 58
Bread-Making,.... 58
Castle-Garden,.... 58
Queries,.... 59
Special Notice to Travellers,.... 59
Advertisements,.... 59

MARCH.

*Brick-Making,.... 65
Absorbent Capacity of Bricks,.... 66
Lake Colors—Their Nature and Manufacture,.... 67
*Steam-Dredging and the Suez Canal,.... 68
The Selection of Wall-Paper,.... 71
*Marble Paper Manufacture,.... 71
Sand-Grinding Machine,.... 73
*The Gothic Furnace,.... 74
Ventilation and Heating by Currents,.... 74
*The Ventilation and Warming of School-Houses,.... 75
*Iron Buildings,.... 76
Hints on Economic Building,.... 78
Copper and its Alloys,.... 79
Cryolite—Where found, Nature, and Uses,.... 80
Chrome-Orange,.... 80
*Illinois State Capitol Design,... 80
The Uses of Gun-Cotton,.... 82
Terra Cotta,.... 82
Building-Stones—Their Preservation,.... 82

APRIL.

*Improvement in Hand-Drills,.. 97
Renovating Silk Hats,.... 97
Memoranda concerning Nails,.... 98
Comparative Weight of Pattern and Castings,.... 98
Flint-Glass,.... 98
Wolfram or Tungsten Steel,.... 99
Cheap Brick Walls,.... 99
*Stereotyping,.... 99
Edge-Tools,.... 102
Road-Dust and Vegetation,.... 102
Aniline Colors,.... 102
Soap-Making in the Olden Time, 103
*Manufacture of Vinegar,.... 104
Textile Fabrics from Glass,.... 104
The Effect of Artificial Light upon the Eyes,.... 105
*The Daguerrean Process,.... 105
Building in California,.... 105
The Piano-Forte,.... 106
The Art of Gilding,.... 106
Ventilation and Warming,.... 107
*Ventilation and Warming of School-Houses,.... 108
*The New-York Fire-Place Heater,.... 109
Cheap Houses—Building on Piśe,.... 110
*The Vermont Slate Industry,... 83
Literary,.... 86
"Too Many Irons in the Fire,"... 87
The Tinning and Silvering of Looking-Glasses,.... 87
*French Sash-Windows,.... 88
Whence came our Silks?.... 88
*Cottage and Villa Architecture,. 89
What Shall Workingmen Read?.. 90
The Dwarf Builders,.... 90
Nature as a Builder,.... 91
Sharpening Files by Corrosion,.. 92
Queries,.... 92
Special Notices,.... 92
Advertisements,.... 92
Economic Furniture,.... 111
The Manufacture of Cases for Percussion-Caps,.... 111
*The Thames Embankment,... 112
*Automatic Indicator for Water and Steam,.... 115
*Winds and Chimney Draughts, 115
*Improved Electric Fuse,.... 116
*Stone-Breaking and Ore-Crushing,.... 117
Literary,.... 118
Are Men Equal?.... 119
Beauty in the Household,.... 119
Coöperation,.... 120
Irish Moss,.... 121
*Cottage and Villa Architecture,. 121
Public Baths,.... 121
Manufacture of Brushes,.... 122
A Large Building,.... 122
To Clean Glass,.... 122
How to Make the Peasley Cement,.... 122
Polytechnic Association of the American Institute,.... 122
Manufacturer and Builder at $1.50 per year—How it is Done, 122
Large Cash Premiums,.... 123
Queries,.... 123

MAY.

*The Telephone,.... 129
Peroxide of Hydrogen for the the Hair,.... 130
The Daguerrean Process,.... 130
Glue,.... 130
How to put a Cross-cut Saw in Order,.... 131
Coraline Dye—Injurious Effects Therefrom,.... 131
Mixing Things Up,.... 131
*On Boiler Explosions,.... 132
How to Repair Chain Pumps,... 134
New Element,.... 134
*Béton Building,.... 135
Hydraulic Mortar,.... 135
Shellac for Water-Proof Coatings, Dyes, Paints, and Printing Inks,.... 136
*Improvement in Billiard Tables,.... 137
Historical Notes on Paper Manufacture,.... 137
Kalsomining Walls,.... 138
A Plea for Stone,.... 138
On Forging, Hardening, and Tempering Mill-Picks,.... 139
Chrome-Yellow Paint Practically Tested,.... 138
*Water-Closets,.... 140
Welding Copper,.... 140
The Largest Suspension Bridge, 140
*Improved Hoisting Apparatus, 141
Colored Marbles,.... 141
The Piano-Forte,.... 142
Thames Embankment—South side,.... 142
Seaweed Charcoal,.... 142
Ventilation and Warming,.... 143
The New Metal Hydrogenium,.. 144
Painting Zinc,.... 144
Artificial Alizarine for Coloring, 144
Prisian a little Scratched,.... 144
Suez Canal,.... 144
*The New State Emigrant Hospital, Ward's Island,.... 145
Magenta,.... 145
Varnishes for Iron,.... 147
Ornamental Glass—Opaline and Enamel,.... 147
Ship-Building—Here and in England,.... 147

JUNE.

*Improved Steam Pump,.... 161
What Paint shall we use?.... 162
Varnishes—their Nature and Manufacture,.... 162
Something of practical Importance in the Use of Plaster-of-Paris,.... 163
Influence of Water in the Manufacture of Wax-Leather,.... 163
Why do we Oil our Whetstones?. 163
Compressed Leather,.... 163
*The Art of Electrotyping,.... 164
Practical Hints on Working and Tempering Steel,.... 166
Spiritual Photographs,.... 167
"Too Much Pork for a Shilling," 167
Credit to whom Credit, etc.,.... 167
Store-Shutters,.... 168
Damp Cellars,.... 168
The Velocipede as a Mechanical Agent,.... 168
Calculating Areas by Weight,... 168
Aniline Gray,.... 168
The Generation of Oxygen Gas from Sulphuric Acid,.... 168
*On Testing Iron by Magnetism, 169
Blowing a Wine-Glass,.... 169
How Jewelry is Made,.... 170
American Wheels,.... 170
Ventilation and Warming,.... 171
The Manufacture of Pins,.... 171
Right-Handand Left-Hand Locks 171
Lisieux and its Linen Factories, 171
Cleaning Gilded Ware,.... 171
Encaustic Tiles,.... 172
*Salt—its Manufacture and Uses, 172
Paper Belting,.... 173
Vegetable Oils—their Production and Purification,.... 174
Chimneys and Chimney-Shafts,. 174
Artificial Stone,.... 175
Plank Walls for Cottages,.... 176
New Fact in the Behavior of Iron,.... 175
Science and Art,.... 175
*The Kansas City Bridge,.... 176
Cement to resist Red Heat and Boiling Water,.... 178
Recovery of Fatty Matter from Waste Soap-Waters,.... 179
Paper Houses,.... 179
Sodium as a Substitute for Phosphorus in Lucifer Matches,.... 180
A Plea for Iron,.... 180
To Keep Nails from Rusting,... 180
*Wrought-Iron Arch Girder Bridge,.... 181
Liquid Fuel,.... 181
New Mode of Breaking Masses of Iron,.... 181
Utilization of Street Dust,.... 181
Literary,.... 182
How to Spoil a Husband,.... 183
Chess,.... 183
A New Alloy,.... 184
*A Country or Suburban-Barn,.. 184
A New Material for Bonnets,.... 185
*Design for a Summer House,... 185
Workingmen as Students,.... 185
Eating,.... 185
The Philosophy of a Candle,.... 186
Adulterations,.... 187
Recipes for Earthern-Ware Glazing,.... 187
Hemp,.... 187
A Poor Prospect for the Year 1900,.... 187
Setting Fence-Posts,.... 187
Queries,.... 187
New Advertisements,.... 188

The above speaks for itself. In a period of six months we have given upward of **500 COLUMNS OF MATTER,** from the pens of the best writers in the country, and presented in connection therewith upward of **150 ENGRAVINGS,** at an aggregate cost to ourselves of over **$25,000,** but to our readers of only **75 CENTS,** and in cases where they have joined in clubs, at **50 CENTS, AND LESS.**

Our object has been to furnish not only a GOOD periodical, but a CHEAP one, and we trust that our friends will so far appreciate our efforts as to use a little effort for the still further extension of our circulation. As an **EXTRA INDUCEMENT** to obtain subscribers, we have concluded to make the following **LIBERAL OFFER,** which holds good during the **SIXTY DAYS** following July 1st, 1869:

To anv Person sending us the names of TWO SUBSCRIBERS, with full amount of the Subscription, THREE DOLLARS, we will send a copy of The Manufacturer and Builder FREE, FOR ONE YEAR.

Address,

WESTERN & COMPANY,

P. O. Box 5969. **No. 37 Park Row, New-York.**

ENGINEERS' SUPPLIES.

STEAM ENGINES

FROM 4 TO 500 HORSE-POWER,

Including CORLISS PATENT CUT-OFF ENGINES, SLIDE VALVE STATIONARY ENGINES, and PORTABLE ENGINES. Also, IMPROVED CIRCULAR SAW MILLS, Etc.

Send for Descriptive Circular and Price List.

WOOD & MANN Steam Engine Co.,
Utica, N. Y.

Warerooms, 42 Cortlandt Street, New-York, and 201 and 233 South Water Street, Chicago, Ill.

Nov. 7-1y-os

New-York Belting and Packing Company.

The oldest and largest manufacturers in the United States of

VULCANIZED RUBBER FABRICS,

Adapted to Mechanical Purposes,

Invite the attention of all who are interested in the sale or use of such articles to the high standard quality and low prices of their various manufactures, comprising

Machine Belting, Steam Packing, Leading Hose, Suction Hose, Car Springs Wagon Springs, Billiard Cushions, Grain Drill Tubes, Etc., Etc.,

"TEST" HOSE

made expressly for the use of Steam Fire Engines, and will stand a pressure of 400 pounds per square inch. Officers of Fire Departments requiring new hose, will find this much superior in strength and quality to any other.

PATENT SOLID EMERY VULCANITE WHEELS,

A composition of rubber and emery, making a very hard uniform substance of the nature of stone throughout. These wheels for grinding and polishing metals, "gumming" saws, etc., are the most economical and effective tools that can be used.

Warehouse, 37 and 38 Park Row, New-York.

JOHN H. CHEEVER, Treasurer.

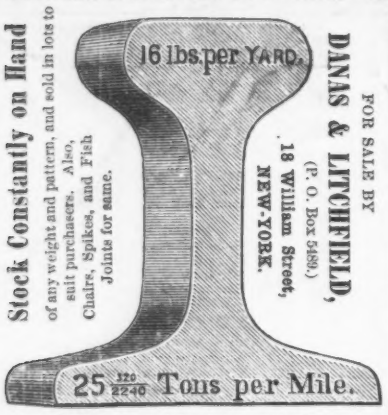
☞ Price lists and further information may be obtained by mail or otherwise on application.

Oct. 30-1y-os

B. F. STURTEVANT'S
NEW PATENT IMPROVED
FAN
PRESSURE BLOWERS
MANUFACTORY & SALESROOM
72 SUDBURY ST. BOSTON.

Feb. 13-1y-os

Railroad Iron for Mines.



Stock Constantly on Hand of any weight and pattern, and sold in lots to suit purchasers. Also, Chairs, Spikes, and Fish Joints for same.

DANAS & LITCHFIELD, (P. O. Box 5089.) 18 William Street, NEW-YORK.

FOR SALE BY

LIGHT LOCOMOTIVES, FOR USE IN COLLIERIES, Etc.

March 13-6m

HEBBARD CAR SPRING CO.,

MANUFACTURERS OF

PATENT RIGHT AND LEFT SPIRAL

Steel Car Springs.

M. B. WASHBURN, General Agent,
137 and 141 Elm Street, New-York City.

Jan. 23-1y-isq

WOODWORTH PLANERS AND MATCHERS, Lee's Patent Moulding Machines, Morticing, Tenoning Machines, etc. HAMPSON & COPELAND,
July 6-tf-os 42 Cortlandt Street, New-York.

Portable Steam Engine & Manufacturing Co.

Manufacturers of Portable and Stationary

STEAM ENGINES,

FROM 3 TO 80 HORSE POWER,

Portable Circular Saw Mills, Car Wheels, Shafting, Etc., Etc.]

WATERTOWN, N. Y.

Fo Descriptive Price-List with Cuts, address

July 27-tf I. P. POWERS, SEC'Y.

ENGINEERS' SUPPLIES.

ATTENTION ENGINEERS,

MINERS, QUARRYMEN.

Lamson's Patent Stone Channeling Machine,

for quarrying Marble, Slate, Grindstone, Sandstone, and other rocks; does the work of 75 to 100 men per day; can be seen in the quarries at Rutland, Vt., or at the Company's works.

CASE'S PATENT DIAMOND ROCK DRILL; is pointed with black diamonds; is adjusted and operated by one man; bores in any direction, or under water; bores in Marble 8 inches, in Granite 5 inches, in Quartz 3 inches, in Talc 6 inches per minute. One drill-head has bored over 2000 feet without repair, and is still perfect. Address

THE WINDSOR MANUFACTURING CO.,
Windsor, Vt.

☞ Arrangements made for manufacturing any new Patent Machines. Feb. 27-6m-is

---

WIRE ROPE

MANUFACTURED BY

JOHN A. ROEBLING'S SONS,
TRENTON, N. J.

FOR

Inclined Planes, Mining,
Standing Ship Rigging,
Suspension Bridges, Ferries,
Stays and Guys on Bridges,
Cranes and Shears, Derricks,
Tillers, Etc.

A large stock of wire rope constantly on hand. Orders filled with dispatch.

☞ For strength, size and cost see circular, which will be sent on application. Dec. 26-tf

MANUFACTURERS' SUPPLIES.

MERRICK & SONS'

SOUTHWARK FOUNDERY,

No. 430 WASHINGTON AVENUE, PHILADELPHIA.

William Wright's Patent Variable Cut-Off Steam Engine, regulated by the Governor. Merrick's Safety Hoisting Machine, Patented June, 1868. David Joy's Patent Valveless Steam-Hammer. D. M. Watson's Patent Self-Centering, Self-Balancing Centrifugal Sugar Draining Machine, and Hydro Extractor for Cotton and Woollen Manufacturers. Nov. 15-1y

---

SARGENT CARD-CLOTHING CO.,

WORCESTER, MASS.,

MANUFACTURERS OF EVERY VARIETY

MACHINE CARDS

for COTTON, WOOL and FLAX, set in LEATHER, CLOTH, etc., etc. Also, in LEATHER with FELT FACE.

SPECIALTY.

Our Patent PAPER-BACK CARDS, for Drying Machines and heavy work.

All descriptions of HAND and STRIPPING CARDS, Manufacturers' Supplies, etc., furnished to order at LOWEST market prices.

SARGENT & CO., New-York Agents.

Ap. 24-1y-q EDWIN S. LAWRENCE, Agent.

SUMNER PRATT,

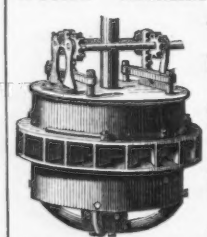
Cotton and Woolen Manufacturers' Agency.

All kinds of Machinery, new and second-hand, and General Supply Store.

May 15-tf-q WORCESTER, MASS.

HUNT, WAITE & FLINT,

Woolen Machine Manufacturers,



And Manufacturers of Upright and Circular Saw Mills,

Breast and Turbine Water Wheels,

Regulators, Elevators, Shafting, Gearing, Pulleys, Gate Screws for Hoisting Gates, Woodworth's Planing Machines, Grist Mills, etc., etc.

Patent Rotary Fulling Mills,

Hammer Falling Stocks, Fulling Mills, Dusters, Washer for Rinsing Cloths, Dolly Washers for Hosiery Goods, Wool Washers for washing Wool, Gigs, Dye Tubs, Blue Vats, and Steam Boxes.

Also Iron Founders. Every description of casting furnished at short notice. All Machines and Castings furnished at this establishment warranted.

June 5-tf-q ORANGE, MASS.

Turbine Water Wheel Manufacturing Co.

CHASE'S

IMPROVED EXCELSIOR JONVAL

TURBINE WATER WHEEL.

J. D. Chase & Sons and D. Pomeroy's Patent, July 31, 1866. Chase's celebrated improved superior

Circular Saw Mills.

Surveys for Dams, Mill-Sites, etc. Cotton, Woolen, Paper, Lumber, Flouring and Grist Mills constructed. Shafting, Gears, etc., at short notice. For Circulars with Cuts, representing prices and description, please address

J. D. CHASE & SONS, Agents,

June 5-tf-q ORANGE, MASS.

MACHINISTS' SUPPLIES.

MINTER & MARCY,

MANUFACTURERS OF

Milled Machine Screws,

No. 44 EXCHANGE STREET,

WORCESTER, MASS.

April 24-1y-q

MILLED MACHINE SCREWS.

ATLANTIC SCREW COMPANY,

Manufacturers of all kinds of Machine Screws, square, round, hexagon and countersunk Heads. Also, Machine and Hand Taps.

E. A. BAGLEY & CO.,
Worcester, Mass.

☞ Please send for Circular and Price List.

May 15-1y

WOOD, LIGHT & CO.,

MANUFACTURERS OF

IMPROVED LATHES,

FOR TURNING SHAFTING.

IMPROVED COUPLING BOX,

with Locks on Shaft for connecting Shafting; and

IMPROVED BOLT-CUTTER.

Persons purchasing Shafting, or engaged in its manufacture, or having use for a Bolt-Cutter, should examine these improvements, before purchasing elsewhere.

☞ WAREHOUSE, 107 Liberty Street, New-York City.

☞ MANUFACTORY, Junction Shop, Worcester, Mass. April 24-1y-q

LUCIUS W. POND,

MANUFACTURER OF

MACHINISTS' TOOLS,

New and Improved Patterns of Lathes, Planers, Drills, Milling Machines, Boring Mills, Slotting Machines, Gear and Bolt Cutters, and Punching and Shearing Machines. Dealer in

Iron and Wood-Working Machinery.

Works at Worcester, Mass. Office, 98 Liberty St., New-York.

Aug. 4-1y-os. S. N. HARTWELL, General Agent.

JOHN F. WERNER,

Model Maker and Machinist.

Particular assistance given to Inventors in developing their designs of working Models for the Patent Office. All kinds of Tools, Gear Cutting, Patterns, and Turning done to order, and Repairing promptly attended to.

No. 62 Centre Street, New-York.

Aug. 22-1y-os

STATIONARY AND PORTABLE ENGINES of all sizes, Boilers of all kinds, always on hand. HAMPSON & COPELAND,
July 6-tf-os 42 Cortlandt St., New-York.

THE THOMAS IRON WORKS,

Worcester, Mass.,

Manufacturers of THOMAS' PATENT LATHE and UPRIGHT DRILL, and all kinds of Machinists' Tools of superior quality.

ALFRED THOMAS. DAVID P. BROWN.

May 15-1y

Clinton Iron Foundry,

502 and 504 Water, and 239 and 241 Cherry Streets,

Between Pike and Rutgers Slips, New-York.

LEADER PIPES,
PULLEYS, HANGERS,
GRATE BARS,
MACHINERY PATTERNS,
OF ALL KINDS.

ALSO,

LOAM AND DRY SAND CASTINGS

of every description, for mining purposes, made to order at the shortest notice and on reasonable terms.

W. McKINLEY. R. SMACK.

Oct. 26-1y

FITCHBURG MACHINE COMPANY,

MANUFACTURERS OF

Machinists' Tools, Shaftings, Pulleys, Hangers, Mill Work, etc.,

SUMMER STREET, FITCHBURG, MASS.

S. C. WRIGHT, Pres't.
J. L. CHAPMAN, Sec'y.
A. WHITMAN, Treas.

June 5-tf-q

PORTABLE HOISTING ENGINES, suitable for Mines, Pile Driving, Unloading Vessels, Building purposes, etc. HAMPSON & COPELAND,
July 6-tf-os 42 Cortlandt St New-York.

DRAWING MATERIALS.

WHATMAN'S PAPERS.—White and Yellow Roll Drawing Paper, 40 and 54 inches wide. Tracing Muslin, Tracing Paper. Muslin-backed Drawing Paper, 40 and 54 inches wide. Winsor & Newton's Colors India Ink. Faber's Drawing Pencils, etc., etc. Priced Catalogues sent free.

JAMES W. QUEEN & CO.,
July 6-tf-os 924 Chestnut st., Philadelphia.

FILE-COVERS. FILE-COVERS.

For preserving the numbers of the ENGINEERING AND MINING JOURNAL. Price $1.50. For sale by

WESTERN & CO., 37 Park Row, New-York.

A MAN of middle age and experience, capable of managing a mechanical business or manufactory, desires to negotiate for a permanent situation. West preferred. The objects of his present engagement being nearly accomplished, he refers to his present employers and others. Address Engineer, care W. E. CHURCH, 14 Wall Street, or this office. July 20-tf

MISCELLANEOUS.

HAWKINS, HERTHEL & BURBAL.

CIVIL AND MECHANICAL ENGINEERS,

BUILDERS OF

Herthel's Patent Truss, and other Iron Bridges, Roofs, and Turn-Tables. Also Howe's Patent Truss, and other Timber Bridges, Roofs, and Turn-Tables.

Corrugated Iron Doors, Shutters, and Iron Building Material generally. Contractors for Piling, Docking, and General Railroad Work.

July 20-1y SPRINGFIELD, MASS.

A. D. BRIGGS & CO.,

CIVIL AND MECHANICAL ENGINEERS,

BUILDERS OF

Truesdell's Patent Truss Bridge, and other Iron Bridges, Roofs, and Turn-Tables. Also Howe's Patent Truss Bridge and Roof, and other Timber Bridges and Turn-Tables. Particular attention given to repairing all kinds of Bridges. All work warranted to give satisfaction. Plans, Estimates, and Specifications, upon application.

July 20-1y SPRINGFIELD, MASS.

FUEL FROM BOG-PEAT AND TURF.

Competition with Coals from Pennsylvania.

Cheap Fuel for Districts where Wood is Scarce.

Central Peat-Fuel and Machine Co. of Connecticut.

OFFICE AT PORTLAND, CONN.

EDWIN J. HULBERT, Secretary,

To whom all communications may be addressed.

We offer for sale machines, a method, and instructions for preparing from a good quality of Bog-Peat or Turf, a fuel nearly equal to the best coal, and 12 per cent better than dry, hard maple wood, at a cost not to exceed $2 per ton, dry, serviceable, and merchantable; to be made, between April 1st and November 20th, in the Northern and Eastern States.

The machines we offer are suited:

TO FARMERS; to be worked by man power, and capable of turning out fuel at the rate of TWO tons per day.

TO MILL-OWNERS and Country Manufacturers; to be driven by horse-power.

TO RAILROAD COMPANIES, Smelting Works, Iron Furnaces, and large Manufacturing Companies; to be operated by steam power—40 horse power being capable of manufacturing 100 tons per day.

To Farmers and others, we will sell small machines for cash, giving a full and sufficient guarantee of performance as above stated.

To Railroad Companies and Manufacturers, we will sell machines at manufacturers' billed prices, they also to pay for transportation and erection; will take for patent and method a proportion of *their net profits*, guaranteeing them against loss, and allowing 10 per cent for interest in the capital thus employed (which in no case shall exceed $15,000 in order to produce 75 tons per day).

We issue no detailed circular.

Business communications will be replied to by letter.

EDWIN J. HULBERT, Secretary.

The operation of our machinery may be examined by application to WM. SELLEW, Esq., Superintendent, at the Works on the Etna-bog, 3 miles north of Meriden, Conn., on line of the Hartford and New-Haven Railroad.

July tf

1869.

"The Engineering and Mining Journal,"

AN ILLUSTRATED WEEKLY PERIODICAL.

Intended to advance the interests of those engaged in ENGINEERING AND MINING, in the widest sense of those terms.

VOLUME VIII. COMMENCED JULY 6.

ENGINEERING.

It contains matter of the highest importance to all who are engaged in

Civil Engineering, as in the erection of buildings, the construction of industrial works, public and private, the surveying and laying out of roads, canals, railroads, etc., and the erection of bridges, docks, etc.

Mechanical Engineering, as steam engines, hydraulic motors, the construction of tools, machinery, mill-work, etc.

Agricultural Engineering, as the application of machinery to agricultural processes, and the improvement of agricultural districts by drainage and various other operations involving an acquaintance with engineering practices.

Hydraulic Engineering, as in the planning and construction of water-works, and the improvement of rivers, harbors, etc.

MINING

is a subject that receives equal attention with Engineering. The various interests involved in the mining operations of the country, as

The Coal Trade,

The Metal Trade, and **Market Reports,** wherever they affect these subjects, are fully cared for, while the principles which relate to mining, geology, mineralogy, chemistry, and metallurgy are carefully elaborated, and all new discoveries relating thereto promptly detailed. In the practical departments relating to the working and management of mines, whether of gold, silver, copper, lead, iron, coal, slate, marble, stone, oil, salt, etc., will be found, not only the latest news, but a full discussion of the best methods of developing these important interests and bringing their products into marketable shape.

The ENGINEERING AND MINING JOURNAL is not strictly a new periodical, as for nearly four years it has occupied a prominent position in the field of journalism under the title, THE AMERICAN JOURNAL OF MINING, which is now presented re-modelled, improved, and in a new and more attractive form.

CONTRIBUTORS.

Among its *Contributors* will be found some of the ablest men of the day, and no effort or expense will be spared to make the information conveyed *fresh, trustworthy, and thorough.*

ILLUSTRATIONS.

Subjects requiring the aid of engravings will be fully illustrated by cuts prepared by the best artists. Great pains will be taken in this department.

SUBSCRIPTION.

Subscription price only $5 per annum, in advance; Three Copies, $13.50; Five or more Copies, $4 each.

It will thus be seen that any person sending us the names of four subscribers, with the full subscription rate, $20, will receive an extra copy free.

Single Copies, Ten Cents Each.

☞ Specimen Copies sent free on application to the Publishers. Address,

WESTERN & COMPANY,

P. O. Box 5969. 37 Park Row, New-York.

NEWS DEALERS supplied by the AMERICAN NEWS COMPANY, 121 Nassau St., New-York.